ARCHIVES OF OPHTHALMOLOGY.

SOME SUGGESTED LINES OF CLINICAL RESEARCH.

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THE slit-lamp is an adjunct, and no more, to our general methods of observation in clinical ophthalmology. It is an immeasurable improvement on the older method of crude oblique focal illumination, yet it does not replace even this: for example, an observer neglecting such general preliminary examination might easily miss a localized engorgement of episcleral vessels indicative of a deep growth, or a faint circumcorneal ciliary flush suggestive of deep inflammation.

Two days ago Dr. Baer kindly showed me in Philadelphia a case in which, by ordinary crude oblique illumination, it was perfectly easy to detect an unusual membrane close up against a perfectly clear lens in a young boy, and it was necessary to decide whether this was detached retina or a pathological membrane of cyclitic exudate. Inspection of the size of the blood-vessels did not indicate with certainty the direction of the vessels in this membrane, but slit-lamp examination disclosed the direction of the flow of the corpuscles in the vessels and so gave a clue to the origin and destination of the vessels. Detection of the presence of an objective feature is often not as important or as difficult as the confident assertion of its absence—a fact often not sufficiently appreciated by those who are prone to query the practical value of the slit-lamp in clinical ophthalmology: it is easier to see strands of vit-

[1] By invitation, Ophth. Sect., N. Y. Academy of Medicine, November, 1925.

reous which protrude through the pupil of an aphakic eye making—in a case in which they do so—a connection with the site of the Graefe section above than, in another case, to deny that no such connection exists.

The practical usefulness of the slit-lamp lies in (A) the easier detection of features and signs whose presence is suspected or anticipated on the basis of ordinary clinical examination and experience, or, contrarily, the confident assertion of their absence; and (B) the detection and study of features detectible by no other method. Among the latter are many which are familiar to us already and are fairly well understood as having a definite pathological and clinical significance but are not detectible without the aid of the slit-lamp and binocular magnifier until they are present in what we might nowadays call a gross degree, *e.g.*, intracorneal vascularization, keratic precipitates, posterior synechiæ—signs which for decades past have been recognized as usually being due to either injury or inflammation. But in the case of many other signs, among those not detectible in detail without the slit-lamp, their clinical significance is still uncertain from many points of view—ætiologic, diagnostic, prognostic—and it is to some of these that I want to call attention this evening in the hope that observers may care to collect over a long period data which collectively may afford future information on their significance. I cannot do more than suggest a number of examples now.

I would suggest that it is necessary to be on guard against allowing the imagination too much play: not every white particle seen floating in the aqueous fluid is a leucocyte, or for that matter a cell at all; from the slit-lamp point of view it is merely a "particle." The value of collected observations will depend on records being made over a long period by observers who are precise both as to their technique and methods of slit-lamp observation and also as to their explanation of any significance on the basis of existing proved pathological principles.

The surface-vessels of the eye, conjunctival and episcleral, are of ready access for study. It would be well to ascertain how far their detectible changes in old age, *e.g.*, minute aneurysmal dilatations, are associated with senile changes

of the general vascular system of the body. My impression is that the eye-vessels generally are often immune from detectible senile changes which may be pronounced in the vascular system elsewhere.

The epithelium of the cornea is subject to very fine vacuolation, seen best under a moderately high magnification by retro-illumination in which the focal light-patch behind should be intense, small and sharply defined (see *British Journal of Ophthalmology*, November, 1924). This condition of the epithelium is sometimes seen near an uncomplicated simple (*e.g.* surgical) penetration of the cornea. More often it is more spread and is associated with intraocular inflammatory trouble, especially, it would seem, with chronic insidious varieties of irido-cyclitis in which the function of the corneal endothelium may be presumed to have become impaired. For example, I have seen this epithelial vacuolation located only over the immediate region of large massed lumps of precipitate on the back of the cornea in a case of the type which is usually classed as tuberculous irido-cyclitis; yet I have seen the whole of the corneal area, except for a peripheral margin, show pronounced and closely set epithelial vacuolation as the most evident feature of an attack of inherited specific interstitial keratitis, before any corneal vascularization had set in or any precipitates had become deposited on the endothelial face. In some cases this intraepithelial vacuolation is prone to change visibly in the short time whilst under scrutiny (see *British Journal of Ophthalmology*, November, 1924).

On vascularization of the cornea there are many interesting features worth consideration. We believe that a vessel, or vascular endothelial tube, once formed in the corneal substance is permanent even though it be so small that, when the acute stage of the disease subsides, it may no longer transmit visible blood-corpuscles. In a generation or two hence there will be little opportunity to observe the clinical aspects of inherited syphilitic affections of the eye, and whilst such cases yet occur it may be well to take the opportunity of making careful slit-lamp records. For example: can an attack of luetic interstitial keratitis occur without leaving one permanent vessel in the cornea; in other words, does the absence of any trace of vascularization in the cornea of a

patient known, on the evidence of say nebulæ, etc., to have had in the past keratitis of some sort prove that the keratitis was not due to inherited syphilis? This question can have a medico-legal significance. I have long sought to settle it. I think that a case of a young girl, now under the care of Dr. John M. Wheeler at the Bellevue Hospital, one of the patients examined in our classes there, will afford information on this: she has recently gone through a very severe attack of interstitial keratitis in both eyes, unquestionably due to inherited syphilis. The eye first attacked has by now become all but quiet and up to now not a single blood-vessel has appeared in the cornea; but the other eye, attacked rather later, is still slightly active and it showed, early in the attack, a characteristic vascular invasion. I do know this: an attack may leave only very slight vascularization in the form either of a small localized peripheral invading "brush" of vessels, or of rambling isolated channels here and there with no disposition suggestive of any purposeful "lay-out"; perhaps there may be only one or two channels, but it is exceedingly hard to find a case which, when it has been subject to a true attack of this affection, does not afterwards reveal at any rate some corneal vascularization.

The deep vessels of the cornea in some varieties of inflammation, *e.g.* after injury, often show a very striking feature: the afferent (centripetal) channel of a loop is of much finer calibre than the efferent (centrifugal) returning portion which runs parallel, or nearly parallel, with it, even though no additional tributaries contribute to the returning channel. This, however, is not usually seen in the irregular vascular ramifications of specific interstitial keratitis.

Observations of the nerve-fibers of the cornea are a little disappointing in so far as clinical changes are concerned. A case of Dr. Wheeler's which I saw last year revealed a most uncommon mapping out of very visible lines in the cornea and it emphasized the necessity of understanding the slit-lamp optical characteristics of corneal nerve-fibers—a congenital peculiarity of which they undoubtedly were—in order that these may be distinguished from other possible features, like vessels or membrane-folds, which an inexperienced observer might conceivably think them to be when as abnormal as

they were in this case. Nerve-fibers are anatomically within the anterior two-thirds of the corneal thickness, which they invade from the periphery with a more or less radial regularity of disposition; they are very evident by direct illumination and not evident (practically speaking) by retro-illumination. The disposition of vessels may be very different; and except under certain conditions of changes in the surrounding tissue they are much more evident by retro-illumination than by direct illumination. Folds of Descemet's membrane are situated at the back face of the cornea; they are very evident by retro-illumination and show very poorly, if at all, by retro-illumination.

Folds of Descemet's membrane are a very striking clinical slit-lamp sign. They occur sometimes underneath the region of a superficially embedded foreign-body and sometimes in the neighborhood of corneal perforations; and generally, as is well known, over a cornea which has been much distorted during cataract-extraction, for which reason they are very apt to occur extensively after the manipulations of intracapsular extraction. Though the mechanism of production of these folds has not been adequately explained, it is easier to conceive why they should occur in conditions such as these than it is to explain their presence in the course of intraocular inflammation (irido-cyclitis, etc.). Why they should occur in some inflammatory cases and not in others—apparently unconnected with severity—is by no means clear, and collected records on this subject would be of clinical interest. I believe that when once they have occurred their disappearance during the course of such inflammation is a very definite sign that the associated or causal trouble is subsiding.

The significant term "bedewing" was applied by Vogt to certain pathological changes at the deep face of the cornea, but this term needs careful consideration because it is variously used for many conditions ranging from a mere "dustiness" by retro-illumination—due it may be presumed either to very fine deposits or to actual changes in the endothelium—to much grosser changes, be they excrescences of the face itself. It is not always easy, even for an expert observer, to distinguish in all cases between fine changes of the face and deposits thereon (see *British Journal of Ophthalmology*, No-

vember, 1924) though this should be possible in all cases in which the features are not very fine. Deposits may vary in their disposition and their character (*e.g.* be pigmented or not) and most careful and tedious records have to be kept over long periods if it is hoped to derive useful information as to the clinical association between these aspects and the ætiology of the condition with which the deposits are associated. In many cases of irido-cyclitis precipitates are conspicuously present on the back of the cornea and not on the anterior lens-capsule; in some cases the opposite obtains—they are present on the anterior lens-capsule and not to any marked extent on the back of the cornea. Pigmented precipitates may occur on the face of the posterior lens-capsule as an accompaniment of their appearance in the vitreous.

The aqueous fluid reveals two main phenomena of slit-lamp interest—(1) general increase of visibility of the beam-track which even in all normal cases is slightly visible, and (2) visible floating particles. The increased relucency of the aqueous fluid occurs in various conditions which were described in the *American Journal of Ophthalmology* for January, 1925: these causes may be summarized in general as intraocular injury or inflammation, or any pathological process which may be presumed to affect the secretory activity of the ciliary body. Nevertheless iritis can occur without evident increase in the relucency of the aqueous fluid. When such increase occurs its preliminary onset and subsequent duration calls for the collection of extensive clinical records to ascertain if there is a definite variation with the different varieties of irido-cyclitis. It seems to me that the investigation of the occurrence of visible particles within the aqueous fluid calls of necessity for the rather elaborate procedure of tapping off the aqueous fluid—a procedure which is not without justification if it may be assumed that the temporary production of lowered extravascular tension may be beneficial to a chronic inflammatory process.

The subject of sympathetic ophthalmitis is full of interesting possibilities, not so much as regards an explanation of its cause as its clinical recognition in respect of both the exciting and the sympathizing eye. We usually feel that any injured case may be kept under observation for a period

which is safe if it does not exceed three weeks from the occurrence of the injury, during which time it is necessary to decide as to whether the injured eye is one which is likely to be the cause of sympathetic trouble. The existing conception of a dangerous injured eye, apart from one in which there is gross injury and exposure of the ciliary body, varies somewhat with the clinical experience of different ophthalmologists: some will not fear much danger unless the tension of the injured eye is low; some will lay stress on the danger of an eye which displays variable and intermittent redness; some fear vascularization of the iris—all fairly gross clinical features. What cognate features of a fine nature might not be ascertained by a routine and detailed slit-lamp examination and report of all injured eyes? Admittedly the cautious practitioner is nowadays prone not to leave an injured eye long enough in a patient for it to cause the start of trouble in the other eye, so that it may well be a very long time before we have any useful information on the slit-lamp aspect of this subject. Some assert that once sympathetic trouble has started in the second eye removal of the injured one is bad practice because the course of the disease, once started, will not thereby be arrested and the injured eye may ultimately turn out to be the less useless of the two. But this view entirely depends on what is to be considered satisfactory evidence of impending trouble in the second eye. Apart from symptoms such as paralysis of accommodation, it is very evident that most of the existing knowledge, in so far as it concerns objective signs in the second eye, is based on past methods of observation which are crude in comparison with the finer supplementary methods which are now afforded by slit-lamp technique. Is a given injured eye potentially dangerous? How long is it safe to leave it in situ? Is a given obstinate bilateral iritis sympathetic?—such questions as these, to which we already have answers of a sort, may quite probably be enlightened, at any rate to the extent of a more decisive and useful clinical understanding, if we arrange that observations of injured eyes should at every opportunity include careful slit-lamp investigations. The points to which I suggest attention should be given would include conjunctival and episcleral injection, vascularization of the cornea, nerve-fibers of the

cornea, folds of Descemet's membrane, intraepithelial vacuolation of the cornea, precipitates on and intrinsic changes of the corneal endothelium, the aqueous fluid (beam-track and particles), the iris (vascularization, exudate, adhesions), the lens (specular reflection of the capsules), and the vitreous. Vogt has already reported in his Atlas the occurrence of vitreous granules in two cases which were presumed to exhibit sympathetic irritation.

I will merely allude in conclusion to a few other slit-lamp clinical studies in which collective evidence is called for. The iris-pigmentation undergoes changes in various conditions (senility, glaucoma, etc.) and here we have a pictorial condition which it is not difficult for an artist to portray. The clinical significance of small nodular exudates on the iris, especially at the pupil-margin, is by no means fully settled: I avoid the term "tubercles" because undoubtedly they are by no means a necessary sign of tuberculosis of the eye; they may be very persistent—I have had one patient so affected under careful observation for the past four years and the trouble is still active if unobtrustive. New growths of the iris are rare but they afford a most interesting and pictorial study when they occur.

Those familiar with slit-lamp work nowadays have a fairly definite understanding of the distinction of lens-changes which are congenital, infantile, senile, complicated and traumatic, but there is much in this connection which needs collective observation. An observer needs very long experience if he is to hope to be able to express an opinion as to the probable rate of alteration or increase of lens-changes which have once started: in all probability the interpretation of slit-lamp evidence alone will not in all cases suffice to afford accurate prognosis and in some this may doubtless be impossible.

The subject of the vitreous is admittedly disappointing from a clinical slit-lamp point of view, its practical clinical value at present not amounting to that of examination with a suitable ophthalmoscope properly used. I think, however, that slit-lamp study of the vitreous, especially of the easily accessible retro-lental space, is well worth making in all cases in which the ophthalmoscope reveals gross or fine vitreous changes.

One of the most fruitful fields of investigation, but one which takes much time and care, is the correlation of clinical slit-lamp findings and histological study of the eye after excision. Any eye destined for excision affords such opportunity.

I wish to express, in concluding, my gratitude for the pleasure afforded me by the invitation to present this subject here this evening.

RADIUM THERAPY IN DISEASES OF THE EYE AND ADNEXA.[1]

By G. ALLEN ROBINSON, M.D., New York.

(With eight illustrations on Text-Plates XVI and XVII.)

IN this paper I should like to discuss the use of radium in the treatment of certain benign and malignant conditions involving the eye and surrounding structures.

ANGIOMAS

Angiomas of the eyelid in young children occur frequently and respond favorably to radium treatment. The endothelial cells lining the new growth of capillaries are radio-sensitive, and the end result is that of an obliteration of the vessels. Ulceration should not occur following the treatment as sub-erythema doses are advocated. New and Benedict consider radium specific for hemangioma and lymphangioma. I have treated ten cases with the lesion disappearing in nine, one of which was primary of the occular conjunctiva.

Case 1.—G. G., aged 3 months, was referred for radium treatment April 25, 1924. A large rapidly growing plexiform hemangioma involved the lower right eyelid and right side of the face. Mild radium treatments were given at intervals of three to four weeks for eighteen months. (See Fig. 1 and Fig. 2.)

[1] From the Radium Department, Manhattan Eye, Ear and Throat Hospital, and New York Eye and Ear Infirmary. Read by invitation before the Section on Ophthalmology, the New York Academy of Medicine, February 15, 1926.

ILLUSTRATING DR. G. ALLEN ROBINSON'S ARTICLE, "RADIUM THERAPY IN DISEASES OF THE EYE AND ADNEXA."

FIG. 1.—Hemangioma of Eyelids and Cheek.

Fig. 2.—Twenty-two Months after Radium Treatment.

FIG. 3.—Basal Cell Epidermoid Carcinoma of the Lower Eyelid.

FIG. 4.—After Radium Treatment.

PAPILLOMAS

A papilloma is a general term referring to a local outgrowth of epithelium covering projecting masses of vascular connective tissues. Under this term I have included granuloma pyogenicum, verruca vulgaris and cornu cutaneum. Surgical removal and electrodessication of these lesions is often successful, but there is a tendency to recur unless the base is entirely removed. Radium is of value in the prevention of recurrence and will easily dissolve the primary lesion. The insertion of one to three 10 milligram platinum radium needles into the base of the papilloma for one hour is a satisfactory treatment. A moderate inflammatory reaction occurs during the second and third week after the radium application, but subsides during the fourth week and results in a smooth soft scar.

EPIDERMOID CARCINOMA

Epidermoid carcinoma of the eyelids is nearly always of the basal cell type and, therefore, responds easily to radium treatment. There is little or no resultant deformity and the lesion, if properly treated, remains cured. The technique I have found most effective is the insertion of 10 milligram platinum radium needles three to five millimeters apart into the base of the lesion for one hour. Epitheliomatous nests that lie deep in tissues are thus reached by this interstitial method of irradiation. As a rule it is not necessary to repeat the treatment with needles. A surface application of one or two 50 milligram radium tubes applied for one hour to the lesion four weeks after the initial treatment is beneficial in order to destroy any viable carcinoma cells that remain.

I have successfully treated thirty-four cases of epidermoid carcinoma of the eyelids, two of which were pigmented and diagnosed clinically as melanoma. The youngest patient was aged 38 years and the oldest aged 83 years. The upper lid was primarily involved in five cases.

Good function of the tear duct is preserved in most cases, there is little loss of eyelashes, and so it has become recognized that radium is almost a specific for epidermoid carcinoma of the eyelids.

CASE 2.—Mrs. A. V., aged 38 years, was referred by Dr. Charles W. Kinney, August 27, 1924. The lesion began as a pimple-like growth on the lower right eyelid three years before. It gradually grew larger and ulcerated and at the time of examination was 1 centimeter in diameter and had typical pearly edges. A clinical diagnosis of basalcell epidermoid carcinoma was made. The treatment consisted of implanting five 5 milligram platinum radium needles into the base of the growth for two hours, and five weeks later a surface application was made using a 50 milligram tube of radium screened with 1 millimeter of brass for one hour. A smooth soft scar replaces the growth, and there is no evidence of recurrence to date. (See Fig. 3 and Fig. 4.)

Good results with radium have been reported in epibulbar carcinoma of the conjunctiva. The cornea and sclera offer considerable resistance to these slowly growing tumors, and orbital penetration occurs relatively late. Radium would seem to be indicated in the primary stages, as irritation from cauterization and palliative surgery apparently excites their growth. When perforation has occurred a combination of surgery and radium is indicated.

CASE 3.—J. E., aged 57 years, was referred by Dr. John R. Shannon, November 21, 1923. There was a white hard growth on the right cornea 5 by 3 by 2 millimeters, which began two years before. The pathological report was an early squamouscell epidermoid carcinoma. The lesion practically disappeared under radium treatment after three months. A small area of resistant growth was removed surgically by Dr. Mittendorf on May 21, 1924. A slight recurrence was noticed four weeks later, but dissolved after the final radium treatment and there has been no evidence of disease during the past twenty months.

The following radium dosage was given:

Date	*Amount of Radium*	*Time*	*Mg. Hrs.*	*Screenage, Distance, Location, etc.*
1923 Nov. 21	30 mgs.	30 min.	15	Six 5 mg. radium needles covered with 1 mm. soft rubber, as plaque.

1924				
Jan. 3	5 mgs.	15 min.	1.25	One 5 mg. radium needles applied to lesion.
Feb. 5	30 mgs.	15 min.	7.5	Six 5 mg. radium needles covered with 1 mm. soft rubber, as plaque.
Mar. 5	20 mgs.	10 min.	3.3	Four 5 mg. radium needles covered with 1 mm. soft rubber, as plaque.
June 30	20 mgs.	15 min.	5	Four 5 mg. radium needles covered with 1 mm. soft rubber, as plaque.

In two other cases of epibulbar carcinoma I have used radium following surgery and electrodessication respectively, and no recurrences have been observed for nearly two years. (See Fig. 5 and Fig. 6.)

VERNAL CONJUNCTIVITIS

Pusey, Janeway, McDanald, Shine, Simpson and many others have reported cases of vernal conjunctivitis successfully treated by radium. Janeway's method consisted in the application of the active deposit from the radium emanation on lead foil applied underneath the lid using 200 to 400 millicurie minutes. Simpson employs a full strength unscreened 5 milligram plaque for 15 minutes and repeats the exposure in two weeks, providing the inflammatory reaction has subsided. The soft beta and secondary rays may be eliminated by using a plaque of five 10 milligram platinum radium needles covered with 1 millimeter of soft rubber, although I do not claim this method to be superior to other methods. The applications are made for 10 to 15 minutes with the eyelids everted and at intervals of seven to ten days. The inflammatory reaction has been mild and I have noted no harmful effects produced by the radium on the cornea.

I have treated fourteen cases of vernal conjunctivitis all of which were improved. The granulations did not disappear entirely in nine of the cases, but there was a marked relief of the itching and photophobia, and because of possible injury

to the eyeball the treatments were not continued after relief of symptoms. As a rule three to seven applications are made during the spring and summer months. The patients are kept under observation and treatments resumed the following year for recurrent attacks, which are usually mild.

LYMPHOMA

Boyer reports nine cases of lymphoma and states that they are usually bilateral, are associated with leukemia and that rapid results were produced by radium treatment. I have treated one case of lymphoma that has remained well for over four years.

CASE 4.—H. E., aged 35 years, was referred for radium treatment, February 28, 1921, by Dr. A. E. Davis. A small tumor had been removed from the soft structures above the right eyeball twenty-eight months previously, but had recurred and was again removed February 8, 1921. (See Fig. 7.)

The pathological report by Dr. Ward MacNeal is as follows:

"Grossly there are four pieces of tissue. The longest 35 by 18 by 16*mm* is irregularly lobulated with a smooth capsule along one side, torn surface elsewhere. On section it is solid, fleshy throughout, with small hemorrhagic spots. On microscopic examination the sections show a fairly homogeneous structure of lymphocytes, small type, bound together by a small amount of connective tissue. There is a partial capsule and septa extending inward. There are no demarked follicles, but the blood vessels are well preserved. No mitotis are observed. The tumor lacks the positive signs of sarcoma as destruction of blood channels and rapid proliferation. The slow growth indicates a benign lymphoma, extending only locally without metastasis. The histology is essentially the same as the specimen submitted two years ago. Dr. James Ewing has seen these sections and considers the new growth only slightly more aggressive than the primary one, and points out that it will easily respond to radium treatment. The

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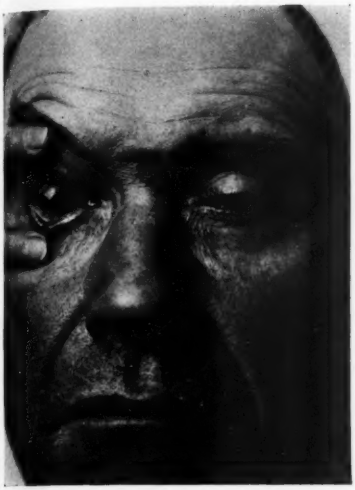

FIG. 5.—Squamous Cell Epidermoid Carcinoma of Conjunctiva.

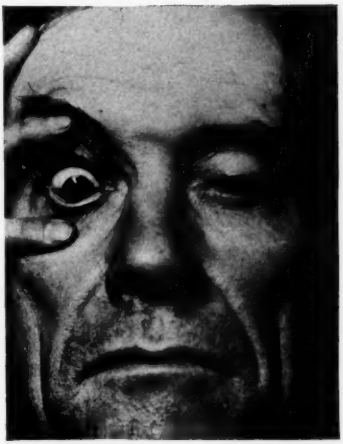

FIG. 6.—Two Years Later.

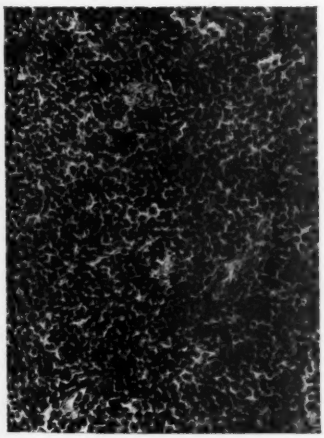

FIG. 7.—Recurrent Lymphoma.

FIG. 8.—Perithelioma.

diagnosis is lymphoma. Local recurrence is probable but metastasis is not to be expected."

The following radium dosage was given:

Date	*Amount of Radium*	*Time*	*Mg. Hrs.*	*Screenage, Distance, Location, etc.*
1921				
Feb. 28	30 mgs.	6 hrs.	180	1 mm. gold, 1 mm. soft rubber applied externally.
Apr. 7	30 mgs.	6 hrs.	180	1 mm. gold, 1 mm. soft rubber applied externally.
May 19	25 mgs.	4 hrs.	100	1 mm. gold, 1 mm. soft rubber, 2 spaces q 2 h.
Aug. 26	100 mgs.	2 hrs.	200	Two 50 mg. tubes, 1 mm. brass at 1 cm. distance.
Oct. 14	60 mgs.	4 hrs.	240	1 mm. brass at 1 cm. distance.
Dec. 19	120 mgs.	18 hrs.	2160	1 mm. brass, at 3 cm. distance, 3 spaces q 6 h.

PERITHELIOMA

CASE 5.—Mrs. C. B., aged 52 years, was referred April 4, 1924, with a recurrent growth underneath the left upper lid at the retro-tarsal fold. The tumor was first noticed about six months before, and removed surgically after three months' duration. A recurrence two weeks after operation was cauterized, and four weeks later surgically removed again. Examination revealed a dark purplish partially encapsulated tumor 2 by 2 by 1.5 centimeters, which bled freely on manipulation. The pathological report was a typical perithelioma as shown by the sheets of polyhedral and rounded cells surrounding artericles.

The lesion was radio-sensitive. One week after the initial radium treatment the bleeding stopped and was one half the original size after four weeks. Three months later the growth was barely palpable, and at the present time there is no evidence of the growth nor of metastasis. A small area of fibrous connective tissue replaces the tumor and the eye is apparently normal.

The following table indicates the dosage of radium employed:

Date	Amount of Radium	Time	Mg. Hrs.	Screenage, Distance, Location, etc.
1924				
Apr. 4	25 mgs.	1 hr.	25	5 mg. platinum radium needles implanted in growth.
Apr. 4	60 mgs.	2 hrs.	100	1 mm. brass capsule applied to external lid 1 hr. to each space.
May 6	25 mgs.	30 min.	12.5	5 mg. platinum radium needles implanted in growth.
May 6	70 mgs.	45 min.	52.5	1 mm. brass capsule, 2 spaces external to orbit.
June 17	50 mgs.	2 hrs.	100	1 mm. brass capsule 2 spaces external to orbit.
Oct. 14	50 mgs.	1 hr.	50	1 mm. brass capsule external to lid.
Oct. 18	50 mgs.	15 min.	12.5	Plaque of radium needles as surface application to lesion underneath lid.

(See Fig. 8.)

INTRAOCULAR TUMORS.

Enucleation is the treatment of choice in intraocular tumors. Since recurrences of melanoma and glioma are common, radium is indicated as a post-operative procedure. Duncan reports three advanced cases of glioma of the retina cured by radium after operation, in one case after recurrence had taken place. Axenfeld reports the disappearance of an early lesion by radium in a patient whose other eye had been removed for glioma. Jacoby, Bushman and Schwab are using deep X-ray and radium therapy in their cases of bilateral glioma. I have used radium in three post-operative cases of primary glioma, two of which are now living and apparently free of recurrences, but the time is too short to report permanency of cures. In one case of melanoma of the choroid and orbit the patient lived a little over five years following enucleation and radium, dying of a metastasis to the liver.

ORBITAL TUMORS.

Perivascular endothelioma and embryonal carcinoma form a large percentage of the orbital tumors and since both types

are radiosensitive, good results have been reported by irradiation methods. Pfahler reports successful results with X-rays in primary sarcoma of the orbit, but failure in nearly all recurrent post-operative cases. I have treated a case of primary sarcoma of the orbit with radium in which there is no evidence of disease after eighteen months, although enucleation of the eye had been advised. In an angiosarcoma of the orbit, the patient is living seven years after operation and radium.

HARMFUL EFFECTS OF RADIUM.

I have observed two cases of cataracts following the use of large doses of radium. One patient, a girl aged six years, had been treated for a sarcoma of the left lower eyelid five years previously. Three thousand milligram hours of gamma radiation in two applications were applied to the orbit at a distance of 3 centimeters. Vision had become blurred and the lens opaque three years after treatment. Examination also revealed a loss of the eyebrows and eyelashes and a marked atrophy of the skin of the lids. The lens was removed December 29, 1925. There was good light perception and projection, and the fundus appeared normal.

The other patient, seen with Dr. Lewis W. Crigler, was a middle aged woman who had a severe diabetes mellitus, and had been treated four years before for an epidermoid carcinoma of the right upper lid. In addition to the cataract a secondary glaucoma developed and the eye had to be enucleated. Young children cannot tolerate maximum doses of radium any more than other forms of medication. Diabetes may have been a metabolic factor in the second case. In the treatment of vernal catarrh more than a mild erythema dose may produce a keratitis or an irido-cyclitis. Pfahler has aptly stated that skill and general medical knowledge is of as much importance in radiotherapy as in surgery.

SUMMARY.

1. Radium is the treatment of choice in angiomas, vernal conjunctivitis, epidermoid carcinoma of the eyelids and early carcinoma of the bulb.

2. Radium is indicated as a post-operative measure in primary intraocular tumors, and should be given first choice in primary orbital tumors.

3. Careful methods of irradiation and a closer cooperation between radiologist and ophthalmologist are necessary to determine the status of radium in diseases of the eye and adnexa.

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DETECTION OF MALINGERERS.[1]

By Dr. E. Tōrōk, New York.

IN most European countries with compulsory military service, malingering, even to self inflicted injuries to the eyes, was quite prevalent for many years past. In this country, however, though cases have occurred in damage suits following accidents, it became of real importance only since the Workman's Compensation Laws were enacted in the various states.

Weakness of human character is responsible for its existence, encouraged, to a certain extent, by the laws which provide no punishment. The injured has nothing to lose but a great deal to gain. If he is successful, and quite frequently he is, his compensation increases manyfold; if he is not successful, he gets his compensation due him according to law but is not punished for the attempted fraud. As a result, in one case that came to my attention, a man tried to collect compensation for the total loss of sight of the same eye twice within a period of three or four years, claiming that the blindness was due to a second accident. The fraud was discovered and all that happened to him was that his claim was disallowed.

In spite of this, it must be remembered, and my experiences fully bear out the fact, that the vast majority of injured persons are honest. Therefore a diagnosis of malingering should be made only after a most careful and thorough examination and observation, careful weighing of all evidence including the history of the injury together with the objective and subjective findings, always keeping in mind that the injured is entitled to the benefit of the doubt. There are several conditions which may, after a superficial, hasty and unsympathetic

[1]Read before Eye Section, N. Y. Acad. Med., January 18, 1925.

examination, lead us to brand a patient as a malingerer though he is perfectly honest and is acting in good faith.

Beginning organic lesions of the fundus may be present, but not sufficiently developed to be recognizable with the ophthalmoscope, thereby giving rise to a suspicion of malingering; hence the importance of prolonged observation and repeated examinations, before making a positive diagnosis. This was brought to my attention very forcibly in the following case.

A young man, 19 years of age, came to me on April 23, 1925, stating that the day before while working something flew into his left eye but fell out again of its own accord; he complained of pain and irritation in the eye. The right (uninjured) eye was normal with $\frac{20}{20}$ vision. The left (injured) eye showed a slight, mostly conjunctival irritation, but was otherwise normal. There was no foreign body in the eye neither was there any defect in the corneal epithelium. The vision was $\frac{20}{30}$, the refraction moderate hyperopic astigmatism. He continued at work. The congestion of the left eye disappeared within two or three days but he constantly complained that his eye was getting worse and finally on May 1st, he declared that he was going to stop work. Examination on this day revealed $\frac{20}{100}$ vision; under homatropine he shadowed a moderate hyperopic astigmatism after the correction of which $\frac{20}{20}$ vision could be obtained; the media were clear; the fundus showed no pathological change. On May the fifth he returned again stating that he had stopped working and that his eye felt much worse. I again examined him under homatropine and found everything including the fundus perfectly normal.

Basing my diagnosis on these findings and also upon the apparently unfounded complaints of the eye steadily growing worse, together with the sudden and inexplicable drop of visual acuity, I decided that he was a malingerer, but asked him to return in three or four days again. He returned on May the ninth at which time the fundus examination again revealed a normal fundus, but the field, which was taken for the first time on this date, showed a central scotoma extending upwards and nasally from the point of fixation. He was now admitted to the hospital and the usual routine examination was made but everything was negative. Under mercury rubs and pilocarpine sweats the eye slowly improved so that on June 3rd his vision was $\frac{20}{70}$ and on June 17th $\frac{20}{50}$. All during this time the fundus showed no pathological changes and the scotoma remained about the same. Diagnosis at this time was acute retrobulbar neuritis.

I did not see him again until July 27th 1925, at which time he had a marked central choroiditis with several recent patches, one of which was pigmented. At this time he showed me a report of an examination made by another specialist on July 5, 1925 who described having found yellowish patches at the macula but no pigmentation.

Now this case, to my mind, is extremely interesting from two points of view. First because it shows us that a man should be pronounced a malingerer only after a very thorough and careful examination and prolonged observation and second because I believe it to be of the utmost importance to know that in a choroiditic lesion pigmentation may appear in the fundus within such a short period of time as 22 days. I, at least, have always thought that a much longer time is necessary for this and have given medical opinions accordingly.

Another fact that should not be lost sight of, is that it is possible that the injured or uninjured eye was poor-sighted or even blind previous to the accident and the patient never knew it, until the accident called his or her attention to it. This is a rather common occurrence, and quite natural that the injured should blame the condition upon the traumatism irrespective of whether the affected eye is the injured one or not.

In many instances these people are honest and not malingerers though following a hasty and superficial examination they may easily be proclaimed as such.

In all cases therefore pre-existing conditions such as high Hy., My., Ast., amblyopia, weakness of accommodation, opacities of cornea, lens or vitreous, fundus diseases, especially macular changes, etc., should be looked for. Here often the previous history, the kind of traumatism that occurred or the account of the accident will be of great help to arrive at the proper conclusion, in determining whether we deal with an honest mistake or malingering.

Other conditions which might easily be mistaken for malingering are traumatic neurosis and hysteria. Patients afflicted with either of these conditions often appear to be malingerers at first. Repeated careful examination and observation are of prime importance in these cases, as the typical neurotic or hysteric symptoms may not be present at

the beginning but may develop later. Hamburger describes a case in which, after a mild blow on the eye, the only symptom was blepharospasm and the man was pronounced a malingerer but observation later revealed typical neurotic symptoms.

These two conditions are closely allied and no sharp division can be made between them.

The symptoms may be divided into four groups:

(1) Disturbance in sensibility such as anæsthesia or hyperæsthesia, neuralgia, photophobia, disturbance in sensibility of skin, conjunctiva or cornea.

(2) Disturbance in vision mostly of subjective nature such as diplopia, monocular diplopia, ploypia, erythropsia, micropsia, amblyopia or amaurosis in one or both eyes, reduced retinal function (Landolt) manifesting itself in hemeralopia or disturbance in light or color perception. Very important is the disturbance in the field of vision which may be of three types:

(a) concentrically contracted field
(b) inversion or crossing of the color fields
(c) tube-like contraction, i.e., if the field is taken from various distances the outer limits remain the same.

(3) Disturbance in motility such as ptosis, blepharospasm, strabismus, myopia, or astigmatism through spasm of accommodation, pupillary disturbances such as miosis or mydriasis, not infrequently accommodative, nervous or retinal asthenopia, nystagmus or insufficiency of internal recti muscles.

(4) Disturbance in secretion, manifesting itself either in diminished watering of the eye or epiphora.

(5) general symptoms such as headaches, quick tiring, insomnia, palpitation of heart, psychic disturbances, loss of weight, etc.

It is significant for diagnostic purposes that these symptoms may appear or disappear following an injury as for instance in the case described by Pfingst where a patient became blind from an accident then fell and his sight returned. It is also significant that they are not constant, and are interchangeable one symptom disappearing and being followed by another.

The differential diagnosis between hysteria and neurasthenia

as stated before, is in most cases extremely difficult, sometimes impossible.

In a general way it may be said that it is characteristic of the neurasthenic eye that it tires very quickly. Neurasthenic patients will complain that they become tired when they read or otherwise use their eyes. This quick fatigue will also be apparent when the patient is examined especially when his field of vision is taken, often a spiral field will be obtained or the concentric contraction will rapidly increase in repeated examinations and it is not uncommon to find that the field of the second eye is smaller than that of the first examined eye even though this is the uninjured eye and has better central visual acuity.

In hysteria on the other hand the prominent symptoms are the sensory and motor disturbances while as far as the field is concerned, the inversion or crossing of the color fields and the irregular, fleeting scotomata are of diagnostic significance. In the differential diagnosis between traumatic neurosis or hysteria and malingering often, especially with a little practice and experience, the patient's behavior and the account of the accident as given by him, will be of considerable help. A neurasthenic or hysteric patient will appear to be sincere, will willingly and intelligently answer the questions asked and will submit to examination and try to cooperate when examined. In other words, his behavior will be that of a patient who comes to the physician to be helped and cured. A malingerer, on the other hand, comes to the physician with the intention to fool him. He is acting and as all amateur actors, he overacts his part, thereby giving himself away. He will come to the office with large black glasses or with a bandage over a perfectly normal eye, will evade answering questions or will give foolish or impossible answers. He will often do everything in his power to interfere with the physician when his eye is being examined. He will keep his eyes tightly shut and will not open them, will complain of excruciating pain when an attempt is made to open his eyes or lift his upper lid; will say that the light from the ophthalmoscope burns and hurts his eyes; when his vision is taken with the Snellen charts he will see numbers on the letter chart or vice versa; should he complain of double vision and be examined with the red glass test

he will see many images, or the double images will appear everywhere in the field and will be homonymous at one time and crossed at another.

The field of vision will invariably show a concentric contraction often down to the point of fixation or very close to it.

As far as the history given by the patient is concerned, the malingerer's history is often as foolish as that of the presser who dropped a hot iron in a pail of water and the steam destroyed his eye; or that of the girl who worked in a candy factory, got a piece of candy in her eye and became blind because the candy was only removed ten days later; or perhaps that of the furrier who was sewing fur by the open window and the wind blew a hair in his eye thereby becoming totally blind. In many cases the malingerer's history will be greatly exaggerated; the object that struck the eye was large, the inflammation that followed the accident was so severe that he was confined to bed at home so that he could not obtain medical aid from his regular physician but had to call in a strange doctor whose name he had forgotten; the pain is always intolerable and the bleeding from the eye so severe that face and hands are covered and several handkerchiefs used up. As an example I might mention the history of a man who was caught in an elevator door December 14, 1923. He said that after the injury he was bleeding from the mouth, nose, ears and eyes. He could not speak for five days and was blind for four hours in both eyes. He came to the office with large black glasses, could not read the test charts as each letter appeared multiplied seven or eight times, and could not be examined with the ophthalmoscope as the examination made him deathly sick.

The history of the neurasthenic or hysteric on the contrary is truthful as can always be ascertained by the official account of the accident or by that of witnesses.

Malingering rarely begins at the time of the accident; it usually begins either during treatment or after recovery; often quite some time later. During treatment malingering often has for its purpose only the prolonging of disability for various reasons. Sometimes the patient wants a rest or vacation with some pay, other times the work is slack in the particular occupation, again at times patients find that their income is increased during illness; most workmen belong to several

societies from which they obtain a certain amount of weekly sick benefit while ill. This together with the compensation makes their weekly income often considerably larger than that earned while doing a whole day's work. I have also known cases where workmen obtained employment with some other employer, received their regular wages there and kept on collecting compensation for disability from their former employer. Malingering in these cases consists in either subjective complaints or in artificially producing objective symptoms. In the former the complaints are watering, itching, burning of the eyes, headaches, pain in and around the eyes and very often photophobia. It is sometimes quite difficult to make the proper diagnosis in these cases, often prolonged observation being necessary. However we must keep in mind that these subjective complaints are always associated with some definite pathological change. Itching, burning, watering of the eyes are symptoms of conjunctivitis, pain in and around the eyes is associated with inflammations of the eye especially those of the iris and ciliary body, while photophobia is a trigeminus function and is present only when the end elements of the corneal nerves are irritated. We must also remember that these symptoms can be relieved by proper treatment.

Now the fact that no objective findings can be discovered to explain these subjective symptoms on one hand, and on the other hand that the usual treatment is of no benefit to the patient, in fact many will claim that they are getting worse, will be helpful in detecting that they are malingering.

In producing objective symptoms irritation or inflammation of the conjunctiva is created by artificial means; either by vigorously rubbing the eye just before examination or introducing into the lower conjunctival sac various substances, solid, powdered or fluid. Some such substances are sand, stone, wall scrapings, cigar or cigarette ashes, powdered tobacco, soap, pepper, salt, heads of matches, sometimes colored substances especially red so as to produce secretion which they think, will appear to be bloody (I happen to have such a case under my care just now), also zinc sulphate, copper sulphate or bichloride solution, tincture of iodine, alcohol, etc.

This artificial conjunctivitis is very severe sometimes; I

recently saw a case which showed ulcers on the bulbar conjunctiva. It is however easily recognized by the fact that it is confined to the lower tarsal conjunctiva, lower cul-de-sac, and lower half of the bulbar conjunctiva while the upper tarsal conjunctiva, cul-de-sac and upper half of the bulbar conjunctiva is normal and free from inflammation. In many cases the amount of secretion discharged from the eye does not correspond with the severity of the inflammation.

Another point of importance is that the inflammation quickly disappears when patient is admitted to a hospital and his eye kept under bandage in contrast to a real conjunctivitis which rapidly grows worse under a bandage.

I have seen cases where this artificial conjunctivitis was produced alternating on the injured and uninjured eye obviously due to fear that permanent damage might result from irritating one eye all the time. Not infrequently artificial mydriasis is produced in the injured eye or in both. Lack of all objective findings to explain this condition and admitting him to a hospital where he can not have access to atropine will reveal the fact that he is malingering. I might mention here that Hamburger in 1911 published two cases both of which could voluntarily dilate their pupils ad maximum. One simulated total blindness with dilated and immobile pupils, the other epileptic fits during which he voluntarily dilated his pupils. I have a case under my care at present, who sometimes produces artificial conjunctivitis in one eye then in the other, sometimes in both then again he switches over to producing mydriasis in one or the other eye or both.

In cases where malingering develops after recovery the motive is either to get compensation for a preexisting pathological change due to some disease or accident or to get compensation when no permanent damage has resulted from an accident. This is called *simulation.* The injured may also claim that the damage done to the eye by the traumatism is of greater extent and severity than is really the case and this is designated as *exaggeration.*

The claim may involve the injured eye alone, but it is not unusual to find patients who claim that the injury to one eye has also reduced the sight of the other.

Now as to claims for preexisting pathological changes in the

injured eye, uninjured eye or both, all future claims can easily be eliminated if the physician, who treats the patient immediately after the accident makes a thorough examination of both eyes. At this time most patients do not think of malingering as yet and will give truthful information as to the condition of each eye previous to the accident. Both eyes should thoroughly be examined at this time and a schematic drawing of each eye is to be made noting distinctly the old pathological changes and the changes due to the recent accident. The vision of both eyes should always be taken at the first examination and if reduction of sight is found, its cause should be determined. I am referring here especially to errors of refraction which should be determined in the injured eye also at this time, if its condition permits and if there is a discrepancy between vision and actual pathological changes due to the traumatism. If this is done, data thus obtained will be of inestimable value later in detecting malingering.

It must be remembered that it is very easy to differentiate between old pathological changes and those due to a recent injury. It is much more difficult and often impossible, especially if patient is examined several months later, to determine whether or not the pathological change found in the eye, is the result of the accident the patient claims it is due to, or to a previous accident, or perhaps to some disease.

Time elapsed between accident and examination, the knowledge of how the accident occurred, its nature, the subjective symptoms after it, the beginning and length of disability, the kind of treatment received, whether confined to bed or not, to hospital or not, together with the form, size, location and nature of the pathological change, the condition of other parts of the injured eye, the condition of the uninjured eye and other such points will often enable us to determine with reasonable certainty whether or not the patient is malingering. The difficulties here vary with each case and with what is to be determined.

It will not be difficult to differentiate between scars from lime or acid burn and trachoma, but it will be impossible to state whether the acid or lime burn occurred one or two years before the examination.

It will in most cases be easy to recognize an opacity of the

cornea due to phlyctenular or interstitial keratitis or perhaps one due to a trachomatous pannus, but it will be impossible to determine, a few months after the accident, whether a corneal scar present then, is the result of a foreign body or was there before the accident. If a cornea shows several opacities due to foreign bodies it will be impossible to determine which one of those is the result of a particular accident, which have antedated it and which have developed later.

The same may be said about pathological changes occurring in other parts of the eye, and innumerable instances may be cited to illustrate it.

In malingering where compensation is claimed when no damage occurred to the eye or where the actual damage is exaggerated the motive is self evident. Patients may claim total blindness or reduced sight in one or both eyes. It is quite uncommon to claim total blindness of both eyes because it is a condition rather inconvenient and difficult to simulate; the reaction of the pupils and the patient's general behavior as well as his appearance and expression of his face will usually help us to detect the malingerer. It must however be remembered that cases exist where there is pupillary reaction to light when the patient is actually blind, on the one hand and on the other hand, there are cases where the pupil does not react to light and still the patient has good vision and also that the staring, fixed look and upward turning of the face, so characteristic of blind people, may be acquired by practice. I have had only one such case in my practice. This was the case of a man 46 years old who got a piece of steel in his right eye in August, 1916. The steel was removed with the magnet in April, 1917, an infection set in and the eye was enucleated two weeks after the magnet operation. I saw him two weeks after the enucleation at which time the left eye was normal and the acknowledged vision $\frac{1}{1\,\overline{8}}$. I saw him several times between April, 1917 and October, 1917, the eye was always free from inflammation and he always admitted the same vision. He was sent to me again in October, 1920 when he said he became totally blind not having even perception of light. The eye was perfectly normal; the pupil reacted well to light. In many respects he acted like a blind man, but when commanded to look in a certain direction and the hand was moved in the opposite

direction, he very often, especially when the command was given in rapid succession, followed the direction of the hand, and it was also significant that when he was asked to walk along a long and narrow hallway at the end of which there was a door, he always raised his arms whenever he came to the door.

The most common claim is either total blindness of the injured or greatly reduced sight in one or both eyes. In some cases the detection of malingering is easy, in others extremely difficult; the difficulties varying with each individual case.

Besides observing the patient's behavior, a thorough examination of the eyes should be made, carefully noting the objective findings; the visual acuity, the field of vision and in certain cases the motility; the light and color senses should also be examined.

When examining the eye, all that may in any way interfere with the vision should be noted. In cases of corneal, lenticular or vitreous opacities, it should be observed how much they interfere with the clear view of the fundus, and how much they distort the shape of the optic disk as these observations are quite valuable at times, especially in cases where for certain reasons the actual visual acuity can not be determined and we are obliged to give opinion as to the approximate sight.

The determination of the visual acuity is sometimes very easy, at other times it is quite difficult, and in some cases, where the patient has been coached, it is absolutely impossible. These latter patients will refuse to read the test chart, when one of the numerous malingering tests is employed, indeed some of them will refuse to see anything at all when an empty test frame is put on.

These are the cases where the vision has to be estimated and where our objective findings will greatly help us in giving our opinion as to the extent of the damage existing in the eye.

For determining the visual acuity innumerable tests are available. It would go beyond the scope of this paper to try to enumerate them especially since every physician who comes in contact with malingerers has his favorite test. I myself most commonly use the mirror test whereby the distance between the eyes and the test chart is doubled by the use of a mirror without the patient being aware of it, and Haselberg's

test charts, the principle of which is that the red color on white background disappears when looked at through a properly colored red glass and that it appears black when observed through a green glass.

The test charts are constructed on the principle of the Snellen charts, letters and numbers being used. These are partly black and partly red so that the black part forms a letter or a number, and the additional red lines change it to another letter or number.

Now the green glass is put in front of the supposedly amblyopic eye, while the red glass is in front of the good eye.

If one eye is really blind, the patient will see only the black letters, but if he sees with both eyes he will read the letter and numbers as they appear with the additional red lines, as the red lines will appear to him black through the green glass. The advantage of this test is, that it can not only be used to detect malingering, but being constructed on the principle of the Snellen charts the patient's actual visual acuity is determined at the same time.

As far as the examination of the field of vision is concerned Graefe's suggestion to take the field of vision with the point of fixation at various distances from the eye may be used. The field of vision actually grows larger the further away we put the point of fixation, but it is natural for the malingerer to believe that it should be smaller the greater the distance between his eye and the point of fixation, and he will so designate the point where the peripheric object first becomes visible. The malingerer's field of vision will become smaller the further away we put the point of fixation from the eye.

Schmidt-Rimpler advises to examine the patient first in the usual way then leave the second eye open and put a prism in front of the first eye. The point of fixation will now appear double and the patient will be obliged to give accurate answers as to the position of the peripheric objects.

Smeeters advises to cover the arc of the perimeter together with the point of fixation with a dark cloth upon which new points of fixation are marked with chalk at various distances from the real point of fixation. These are put in different meridians and the peripheric limits of the various points of fixation are determined, as quickly as possible; the malingerer

becomes absolutely confused and his statement contradictory. The examination of motility will but very seldom be necessary, as it is extremely rare that double vision is claimed, and then absence of all signs of paresis or paralysis of any of the ocular muscles and his unreasonable answers when examined with the red glass test will be significant.

The examination of the light and color sense will only be necessary where a differential diagnosis is to be made between hysteria and malingering, and the presence of other symptoms of hysteria will enable us to come to the proper conclusion.

THE INTRANASAL LACRIMAL SAC OPERATION.[1]

Its Advantages and its Results.

By Dr. J. M. WEST, Tamaqua, Pa., Late Otolaryngologist Clinic of Professor Silex, Berlin, Germany.

(With six illustrations on Text-Plates XVIII. and XIX.)

WITH few exceptions the treatment of dacryostenosis on the ophthalmological clinics has made little or no progress within the last thirty-eight years. At the Ophthalmological Congress at Heidelberg in 1868 Berlin reintroduced the almost forgotten operation, the external extirpation of the lacrimal sac, and twenty years later de Wecker recommended the removal of the palpebral tear gland. These two operative procedures, together with irrigation of the lacrimal apparatus, probing of the nasal duct, instillations, incisions in cases of phlegmon, incisions and curettage in cases of fistula, were the usual methods of treatment of dacryostenosis and its results until within recent years. Dacryostenosis is on most clinics treated in about the following manner:—Cases of dacryocystitis are treated by irrigations of the sac and probing of the duct, and when no result is obtained, the sac is extirpated through an external incision. And in order to avoid the epiphora following removal of the sac some ophthalmologists remove also the tear glands. When fistulas do not respond to irrigations, incision and curettage is resorted to. Phlegmons resisting treatment with compresses are incised and after the inflammation has subsided the sac is extirpated. Should a fistula result from the incision of the phlegmon, it is usually curetted as stated above.

With a complete extirpation of the sac one can cure an

[1]Read before the Section on Ophthalmology, Academy of Medicine, New, York, Feb. 15, 1926.

uncomplicated case of dacryocystitis, however, the operation is usually followed by epiphora whether the tear glands are removed or not. Apparently, where there is no outflow into the nose, the subconjunctival glands of Krause alone produce sufficient tears to cause epiphora even after both the orbital and palpebral glands have been eliminated. The small percent of patients who escape tear drop following removal of the sac (or sac plus glands) are individuals with an abnormal hyposecretion of tears.

The results of curettage of a fistula are extremely uncertain. I have cured a number of lacrimal fistulas with the intranasal tear sac operation, which had previously been operated upon several times unsuccessfully from the outside. One patient had indeed undergone *seven* external operations from recognized authorities before she entered Professor Silex's clinic with her fistula still persisting. In this case the fistula closed the same day that I did the intranasal operation, which I am advocating, and a personal examination four years later showed that the case had been completely cured. But even if a fistula be cured by external operations the distressing epiphora remains to plague the patient.

The external incision of a phlegmon necessitates painful changes of dressings extending over a period of ten days to two weeks, and in the end often a fistula remains to be curetted as above described. And should the incision close without a fistula there still exists the disagreeable epiphora and sometimes also a dacryocystitis. In such conditions the sac is usually extirpated, which procedure may remove the suppuration but not the epiphora.

In cases of simple epiphora due to stenosis of the nasal duct there has not been, until the development of the intranasal operation, any satisfactory treatment at all, because removal of the lacrimal glands does not diminish the tearing, and only rarely does probing help such cases.

Briefly, the results of the treatment of dacryostenosis, as it is still carried out on most ophthalmological clinics are only partial. With the usual procedures here described we may cure a suppuration of the sac or we may, in lucky cases, close a fistula, however, the epiphora remains in the vast majority of cases a source of annoyance to the patient, and a reminder to

ILLUSTRATING DR. J. M. WEST'S ARTICLE, "THE INTRANASAL LACRIMAL SAC OPERATION."

FIG. 1

FIG. 2

FIG. 3

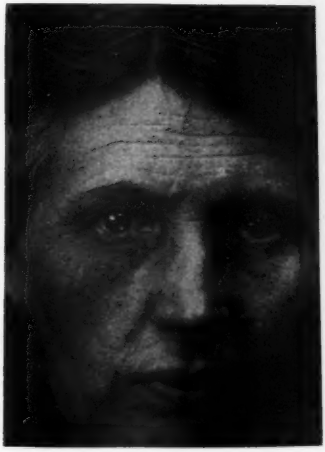

FIG. 4

FIGS. 1 AND 2 (CASE 713–9). A phlegmon in child of 14 years photographed previous to, and then again 10 days after the operation. Last examination nearly three years after operation showed complete cure with restoration of nasal drainage.

FIGS. 3 and 4 (CASE 708–9). Patient with unusually large ectasias of both sacs, photographed before and again a week after operation. Both sacs were operated upon at the same sitting.

FIGS. 5 and 6 (CASE 1875–22). Fistula of three years duration with unusual infiltration and tissue destruction causing a similarity to a carcinoma. The fistula closed promptly and the indurated area at the angle of the eye assumed nearly normal appearance in about a month after the intranasal operation alone without other treatment.

All the cases here photographed were repeatedly examined over a period of at least one year, and most of them were followed for several years subsequent to the operation; and this is sufficient guarantee for a permanent cure.

It will be observed that in this paper I have mentioned only my predecessors in the field of intranasal surgery of the tear sac. The modifications of the procedure by those who followed me I do not consider advantageous, and for the sake of brevity I have not described them here.

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FIGS. 3 and 4 (CASE 708-9). Patient with unusually large eczema of both ears, photographed before and again a week after operation. Both ears were operated upon at the same sitting.

FIGS. 5 and 6 (CASE 18-5-22). Fistula of three years duration with unusual infiltration and tissue destruction causing a similarity to a carcinoma. The fistula closed promptly and the indurated area at the angle of the eye assumed nearly normal appearance in about a month after the intranasal operation alone without other treatment.

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ILLUSTRATING DR. J. M. WEST'S ARTICLE, "THE INTRANASAL LACRIMAL SAC OPERATION."

FIG. 5

FIG. 6

the physician that his case, though relieved, is still by no means completely cured. The experience of most ophthalmologists will, I believe, justify the statements that I am here making.

The cause of the different clinical pictures of dacryostenosis is an obstruction in the nasal duct, and it were more rational and conservative, could we restore the physiological drainage from the eye into the nose, avoid an external incision, and leave the lacrimal glands undisturbed. The restoration of the physiological current in a stenosed passage, either by removing the obstruction or by making an artificial communication of equal physiological value, is the fundamental idea in the treatment of similar stenoses in the human body, for example, in strictures of the intestine or in the gall passages. Why should this fundamental principal in treatment not be applied to strictures of the nasal duct? Irrigation and probing are the only ophthalmological methods of treatment, aside from Toti's procedure, which I shall discuss later, that aim at restoration of the patency of the stenosed passage; and these methods rarely accomplish the desired result.

That the ophthalmologists have found the usual methods unreliable is shown by statements in the textbooks of Axenfeld, de Schweinitz, and Fuchs. Knapp, as early as 1894, was so dissatisfied with the ophthalmological treatment that he considered the lacrimal sac an accessory sinus of the nose, and favored incorporating cases of dacryostenosis within the field of rhinology. Silex insists that if one or two probings in cases of nasal duct stenosis do not improve the condition it is then hopeless to expect a result from the further use of probes, and even if a case improves under the treatment with probes it is usually transitory and the patient returns with his old complaint. I have seen patients, who in the course of one and one-half to two years, had been probed 150 times without any improvement whatever, and also cases which had worn permanent sounds for long periods (one case over three years) without a result. And if it were really possible to cure cases of dacryostenosis within one or two years by irrigations or by probing, I am myself of the opinion that it is more advantageous for most of the patients, if we cure the condition in a week by the intranasal surgical procedure which I am advocating in this paper.

The idea of curing the results of dacryostenosis by a surgical operation, which aims at restoring the drainage from the eye into the nose is very old. It probably dates back to the time when the ancients learned that surgical drainage is the cure for suppuration. At least Galen and the old Greeks and Egyptians had considered the subject. These ancient experiments, however, met with no success, and I am not describing them here.

In recent years there have again been attempts through operative procedures to establish a permanent connection between the conjunctival sac and the nose in cases of nasal duct obstruction. These modern procedures have followed the different anatomical ways to the duct or sac and may be classified as follows: (1) through an external incision, (2) intranasal, (3) from the maxillary antrum, (4) through the mouth. Only one and two will be considered here. The methods three and four, both proposed by von Eichen, are in my opinion more radical than the direct intranasal approach and besides they have other disadvantages. Also, if the intranasal operation be properly performed, we get an excellent exposure of the sac, and hence I find it unnecessary to use the more radical and indirect methods of von Eichen.

1. In 1904 Toti described his "dacryocystorhinostomy," a procedure by which he attempts to establish permanent drainage between the eye and the nose through an external incision at the inner angle of the eye. Aside from the scar which sometimes results (and also keloids have subsequently developed), Toti tells us that his operation is successful in only "more than half of the cases." This large per cent. of failures must depend upon the fact that his external incision disturbs the anatomical relations of the ligimentum internum and the delicate canaliculi. Toti's method gives the best results in cases of ectasie of the sac, but in most cases the sac is not dilated, when the patient comes for treatment. And also in phlegmons and fistulas the procedure is not so well adapted.

And just here it may not be out of place to state that the intranasal method has the following advantages over Toti's procedure: Firstly, the intranasal operation is applicable in *all* the different clinical pictures of dacryostenosis, that is, in dacryocystitis with or without dilatation of the sac, in cases of fistula and in phlegmonous conditions, and also in cases of

epiphora of nasal duct origin, and the percentage of cures, about 90, is much higher than Toti achieves. Secondly, the anatomical relations of the ligimentum palpebrale mediale, the canaliculi, and skin are left undisturbed and hence the chances for physiological drainage into the nose (thus avoiding epiphora) are more favorable than when these relations are interferred with by an external incision. Thirdly, with the intranasal method we avoid the skin incision, the subsequent scar, or the possibility of a keloid, which is to be considered for the most of the cases are women.

I want to acknowledge, however, that Toti's procedure was an advance in ophthalmology, and that he was the first to develop a definite operative plan for reëstablishing drainage from the eye into the nose in cases of dacryostenosis.

2. As to the intranasal surgery of the lacrimal apparatus, I may state that the experience of my predecessors in this field, Caldwell, 1893 (1 case) Passow, 1901 (3 cases), Strazza, 1904 (1 case) and Okuneff, 1908 (6 cases), was not extensive enough to properly develop a technical operative procedure, nor to show definitely that the intranasal treatment of dacryostenosis secures better results than do the usual ophthalmological methods. Also all of my predecessors had removed unnecessarily the anterior end of the inferior turbinate as a step in their operations upon the lacrimal passage.

In 1910 I published seven cases, in which I had intranasally operated upon the lacrimal apparatus thereby, however, leaving the inferior turbinate untouched. The retention of the intact turbinate I have always considered an advance in the technique of my predecessors, and it was the basis of my later improvements in intranasal tear sac surgery.

Although I had entitled my first publication "A Window Resection of the Nasal Duct," I realized at that time that an opening of the duct alone is not sufficient, because the communication must be made above the stricture, and the most frequent stenosis is at the point where the sac joins with the duct, and in my series of seven cases I was forced in some of the patients to open the sac. Also among this original series of intranasal operations on the lacrimal apparatus was a case of fistula, the first recorded case of lacrimal fistula cured by an endonasal procedure.

My small series of seven cases, like that of my predecessors was not sufficient to prove the superiority of the intranasal method over the ophthalmological treatment. What failed was that some rhinologist should work constantly on some large ophthalmological clinic until he should have accumulated a large experience, and had learned how and when to operate in cases of dacryostenosis. This clinical research I undertook to work out on the clinic of Professor Silex in Berlin.

One of the first improvements in technic was that I began restricting the operation to the sac alone, thus leaving the nasal duct untouched. When we have opened the lacrimal sac we are above all possible stenoses in the duct, and hence there is no advantage in opening the canal. Through the interest and generosity of Professor Silex, who placed his unusually large material at my disposal, I have been able in the last fourteen years to do more than 1600 intranasal operations on the lacrimal apparatus.

As far back as 1912 and 1913 I showed cases cured by the intranasal method, and discussed the technic at the different medical societies of Berlin. Since that time I have continually improved the operation until within recent years, in many cases, I do an *intranasal total extirpation of the lacrimal sac.* The sac can be removed through the nose just as completely as the ophthalmologist can extirpate it through the external incision. The intranasal method, however, has the great advantage that it restores the physiological drainage from the eye. It would lead too far to mention the different steps in the improvement of the technic as I have developed it; a general idea, however, of the procedure in its present form may be of interest to the ophthalmologist.

For the sake of clearness I may preface a few anatomical remarks to a brief description of the operation. The lacrimal fossa, which contains the lacrimal sac is formed by the frontal process of the superior maxillary bone anteriorly, and by the lacrimal bone posteriorly. The bony structure of the fossa is covered on the nasal side by the mucous membrane of the nose. Hence the sac is separated from the interior of the nose by a partition, which consists of the bony wall of the fossa forming one layer, and of the nasal mucous membrane forming a

second layer. The principle of the operation consists in removing this separating wall of mucous membrane and bone whereby the lacrimal sac is exposed intranasally.

The operation is done under local anæsthesia (cocaine, adrenalin, injections of novocain) and may be described briefly as follows:—

Incisions are made intranasally through the nasal mucous membrane and are so placed that a large flap of the membrane can be turned aside (not removed) from the region of the lacrimal fossa, and hung down over the inferior turbinate, which is left intact. When this flap is properly made and rolled aside, the lateral bony wall of the nose is laid bare over an area extending from the appatura pyriformis to the posterior boundary of the lacrimal fossa. The bony wall of the fossa is now removed with chisels whereby the sac is freely exposed in the nose. With the sac exposed, we now proceed in one of two ways; (1) excise the nasal wall of the sac, or (2) remove the entire sac. The mucous membrane flap is now returned to its original position and the nose is tampooned. In this operation the sac alone is attacked, the nasal duct is left untouched.

Contrary to expectation the intranasal total extirpation of the sac is only rarely followed by closure of the artificial opening. The epithelium of the canaliculus grows around the corner, so to speak, over the surface of the fascia orbita, and the new opening remains patent. Whether we excise its inner wall, or do an intranasal total extirpation of the sac depends upon the condition we find. In old chronic cases with a thickened sac wall I remove the entire sac.

By means of the operation here described the physiological drainage from the eye into the nose is restored, and the thought arises at once, what effect if any has this condition upon the pathogenic bacteriæ in the conjunctival sac? Bumke and I undertook a bacteriological investigation of this question in Morgenroth's laboratory in the Charité in Berlin. We made cultures, following Elschnig's method, from the conjunctiva, before, and then again daily for several days following the intranasal operation, and found that the pathogenic bacteriæ disappear from the conjunctival sac within one or two days after the operation. In contrast to our results. I may

mention that Mattice in Axenfeld's clinic found pneumococci persisting in the conjunctiva in 43% of the cases examined after the external extirpation of the sac; and, moreover, in some of Mattice's cases the cultures were taken several years subsequent to the operation.

These results of the postoperative bacteriological examination of cases of dacryocystitis is a strong argument for the universal introduction of the intranasal procedure. Particularly in patients with dacryocystitis, in which an intrabulbar operation (cataract, dissission, etc.) is indicated, it is far safer, on account of the danger of infection, to cure the suppuration by the nasal route, rather than by the external extirpation of the sac, because by the internal method the pathogenic bacteriæ disappear from the conjunctiva, while after the external operation pneumococci persist in 43% of the cases. I have performed a number of internal sac operations in cases of cataract complicated with dacryocystitis, in all of which Professor Silex's subsequent extraction resulted in perfect healing.

The prognosis for the restoration of nasal drainage by the intranasal procedure is more favorable in cases, which have not previously been operated upon from the outside. This is because the external incision usually injures the delicate canaliculi. I have, however, cured a large number of cases of epiphora following the external operation, and indeed not only after one external operation, but some of the patients had been previously operated upon several times from the outside before they came under my care. In a given case one can determine by a careful examination whether or not a patient who has undergone one or more external operations is suited for the internal procedure.

INDICATIONS FOR THE OPERATION.

The intranasal lacrimal sac operation is indicated in *all the different clinical conditions caused by dacryostenosis*, that is, in *dacryocystitis with or without dilatation of the sac*, in *lacrimal fistula*, in *phlegmonous conditions*, and also in *epiphora* of nasal duct origin. *Ulcus serpens* with dacryocystitis. Also *chronic blepharitis combined with suppuration of the sac*, and often

practically incurable by other methods, such as the external extirpation of the sac, followed by treatment directed to the conjunctiva, usually disappears after nasal drainage is restored by the internal method. The operation is also indicated in cases of dacryocystitis or epiphora due to ***traumatic stenosis*** of the canal, following injuries of the nose, or resulting from operations on the maxillary antrum. Also many patients suffering from ***epiphora consequent to the external extirpation*** can be cured by the intranasal procedure. Finally in cases of *cataract, etc.*, which require an intrabulbar operation and which are complicated with a dacryocystitis, it is safer to remove the lacrimal sac by the nasal route than to extirpate it externally.

ADVANTAGES OF THE OPERATION.

1. The internal operation is more reliable as a cure for suppuration of the sac than is the external procedure.

2. The physiologic function of the lacrimal apparatus is reëstablished so that not only a dacryocystitis, a lacrimal fistula, or a phlegmon is cured, but subsequently the tears drain off into the nose, and the troublesome epiphora is avoided. The restoration of drainage removes of course simple epiphora of nasal duct origin.

3. As a result of the reëstablishment of drainage from the eye into the nose the pathogenic bacteriæ disappear from the conjunctiva, which is very important, where future intrabulbar operations are indicated.

4. A prolonged, usually painful, and in most cases unsuccessful treatment with probes is avoided.

5. Removal of the lacrimal glands is rendered unnecessary.

6. An external incision or curettage necessitating an external bandage and other disadvantages is avoided.

7. In cases of fistula and phlegmon the patient is spared the troublesome and painful changing of dressings necessary after the external incision.

8. The entire treatment is usually completed in about a week.

9. The operation is not trying upon the patient, and is performed under local anæsthesia in children as well as in adults. Usually the day following the operation there is scarcely any

swelling of the face at all, and bandaging of the eye is unnecessary.

EXPERIENCE WITH, AND RESULTS OF THE INTRANASAL OPERATION.

Among my series of more than 2500 cases of dacryostenosis all the possible clinical pictures of the disease were repeatedly met with, and more than 1600 intranasal operations, all under local anæsthesia, were performed. The ages of the operated cases ranged from 5 to 74 years, and repeatedly both lacrimal sacs were operated upon in one sitting. The fact that the procedure can be carried out, without a general anæsthetic, and not only in adults but also in small children and, moreover, that in my long series of cases there was not one single accident, is a sufficient guarantee that the ophthalmologist can with confidence recommend the operation to his patient.

As to the results in the different classes of cases, I may state that aside from hundreds of cases of *epiphora and dacrocystitis* in which the suppuration was conquered in every case, and physiologic *nasal drainage reëstablished in 90%* of the *cases*, there occurred several dozen *ectasies*, and *phlegmons*, with and without perforation, *all of which* were *cured*. Also several dozen *fistulas* with the exception of two cases *closed* promptly, *usually the same day or the day following the operation*. The first unsuccessful case of fistula was operated upon the year 1911 at which time I lacked the necessary experience. The second failure was a case of a wounded soldier, whose nose was so distorted by his war injury that notwithstanding the internal operation the out flow from the eye met with less resistance through the fistula than through my artificial opening in the nose, hence my nasal opening closed, while the fistula remained open. The fact too that, *preceding my internal operation* the fistula in this second unsuccessful case had been *curetted externally four times*, which increased the already existing nasal deformity, contributed no doubt to my failure in this case. By the intranasal method, however, I have cured quite a number of lacrimal fistulas in cases which came to me after having undergone one or more unsuccessful external operations. One of my fistula cases had indeed been curetted *seven*

times without improvement before being healed by the intranasal operation.

With dacryostenosis the results of treatment can be shown on the photographic plate only in cases complicated by phlegmonous inflammation, by dilatation of the sac, or by fistula. But just in such cases, the most difficult to heal, I desire to picture the effect of the intranasal lacrimal sac operation.

A PRELIMINARY REPORT REGARDING A DEVICE TO BE USED IN LATERAL HOMONYMOUS HEMIANOPSIA.

By Dr. ALFRED WIENER, New York.

(*With one illustration on Text-Plate XX.*)

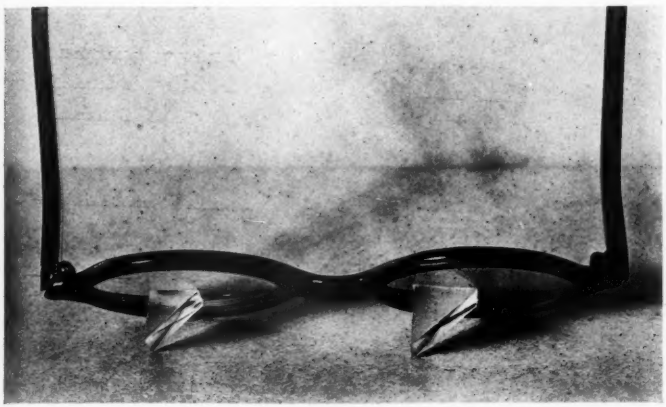
IT is with some hesitation that I am reporting the device mentioned in this paper. I can hardly believe that it has not been thought of or described by some previous author. Up to the present time, I have not been able to find any records of such a device. If it has been made use of by any author and published, I offer him my apologies for the following publication.

It occurred to me recently, in being compelled to advise a young individual, who had been the victim of a fracture at the base of her skull, producing a permanent lateral homonymous hemianopsia, how I might help her to get about the streets in safety. She was constantly knocking into people when walking about, and would only cross a street in the greatest fear.

The solution of this problem, seemed to depend upon some method, by which the rays which fell upon the blind half of the retina, could be reflected over upon the normal half of the retina.

It came to my knowledge, that prisms, whose principal section is an isosceles right angled triangle, afford an important application of total reflection. In such a prism, the hypotenuse may act similar to a plane mirror. For any angle which the incident ray makes, which is greater than the critical angle, a total reflection must take place. When such rays meet the hypotenuse at an angle of 45 degrees, this angle being greater than the critical angle, which is about 41° 48′ for ordin-

ILLUSTRATING DR. ALFRED WIENER'S ARTICLE, "A PRELIMINARY REPORT REGARDING A DEVICE TO BE USED IN LATERAL HOMONYMOUS HEMIANOPSIA."



Photograph of Spectacles as used by patient.

ary glass, these rays will be totally reflected, in this case through an angle of 90°. A pair of spectacles was constructed with such a prism attached, and mounted in the pupillary area. This proved entirely satisfactory. The patient now goes about without the slightest difficulty. As this is only a preliminary report, I have refrained from going into details, but will in the near future. A picture of the spectacle is appended. An improvement upon this device is already contemplated, in which the prism will occupy the entire half of the glass.

CONGENITAL TUMOR MASS AT THE EDGE OF THE OPTIC DISK.[1]

By Dr. ARTHUR M. YUDKIN, New Haven.

(With two illustrations on Text-Plate XXI.)

ABNORMALITIES of the intraocular portion of the optic nerve and its sheaths, except for colobomata are rare. Most of the cases of tumor masses about the optic nerve which have been reported in the literature are of the malignant type. In view of the rarity of benign growths in this area, I report the following case.

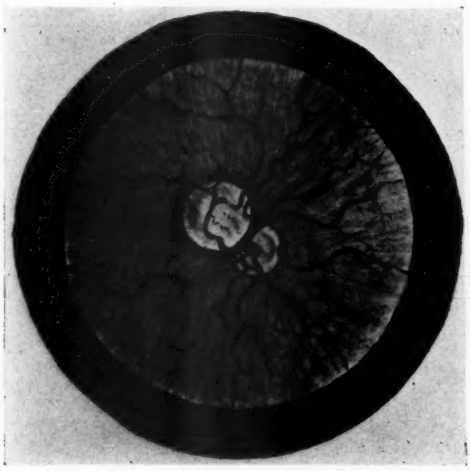
Miss R. P. Æt. 14, was first seen by me December 17, 1923. She complained of headaches which were present after doing close work. There was no family history of ocular disturbance. The patient was well until two years ago when she suffered from a post diphtheritic laryngitis, but has had no ocular trouble as long as she can remember.

Ocular examination: Vision O.D. $\frac{10}{20}$
O.S. $\frac{10}{20}$

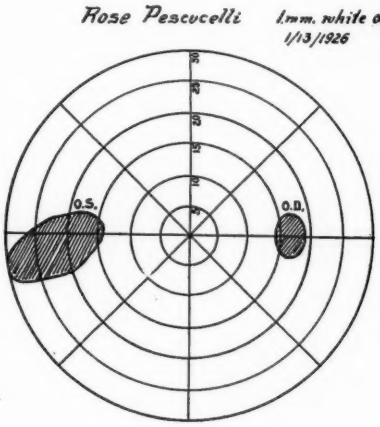
Peripheral field normal and ocular tension normal in both eyes. The examination of the right eye showed nothing abnormal. The left eye presented the following fundus picture. The fundus pigmentation was the same as in the right eye, the optic nerve outline was well defined but in the upper three-quarters of the nasal side of the disk was a raised, almost circular pearly white mass. The elevation was approximately 2 diopters above the fundus, and about one and one-half disk diameters in its longest direction. The margin of this tissue was well defined, showing little,

[1] From the Department of Surgery, Section of Ophthalmology, Yale University, School of Medicine.

ILLUSTRATING DR. ARTHUR M. YUDKIN'S ARTICLE, "CONGENITAL TUMOR MASS AT THE EDGE OF THE OPTIC DISK."



Congenital Tumor Mass at the Edge of the Optic Disk.



Enlarged Blind Spot of Mariotte.

if any pigment in its structure. The area covering the disk margin seemed to be part of the lip of the excavation of the optic nerve. The retinal and choroidal tissue surrounding this mass showed no pathological changes. In the lower nasal part of the elevation was a peculiar inverted V area of pigment which resembled the hooklets of a cysticercus, but there was nothing else to substantiate this finding. A large blood vessel crossed the tissue in an undulating manner, giving the impression of detachment of the retina by a semi solid or cystic mass. There were several other small vessels on the elevation. No other abnormal processes were noted at this examination.

The patient was requested to return for further examination but did not do so.

In January, 1924, I sent for her and after examination, found that the fundus picture had not changed and the mass was the same size, visual acuity and peripheral vision were normal. Patient was seen in July and again in December of 1925. At this time, a complete physical examination was made. The suspicious laryngitis was investigated by Dr. Swain who found nothing abnormal in the larynx and attributed the hoarseness to the old diphtheritic condition. Blood was taken for Wassermann, a tuberculin test was made, and urine examined, but all were negative.

The blind spot as may be seen in the chart was increased. Pressure on the eyeball showed no pulsation of the vessels on the mass. A close examination of the vitreous showed two delicate clumps of tissue which were quite forward but were fairly stationary when the eye was moved.

I considered the larger of the two as a remnant of Cloquet's canal though no signs of hyaloid artery on the posterior lens capsule was to be seen even with the slit-lamp. There were no other floating bodies in the vitreous and no suggestion of any inflammatory processes present.

Comment.

I am inclined to consider this mass a congenital anomaly which is intimately associated with an obliterated hyaloid system. A thorough search of the literature reveals very little of a similar nature. De Beck (1) reports cases from his own ex-

perience and that of others which have some resemblance, in fact, to my case. The greatest difference is that in his description the tumor mass covers the blood vessels. Randall (2) and Parsons (3) describe fundus changes of a similar character. The outstanding features of this case are: (1) the normal visual acuity and peripheral field of vision; (2) the circumscribed and enlarged blind spot; (3) the fundus shows no other pathological disturbance; (4) the area under observation has not changed in over two years; and (5) there are other remnants of the hyaloid system in the vitreous cavity.

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A CASE OF SUBCONJUNCTIVAL ECHINOCOCCUS.

By Dr. GEORGE R. HARE, New York.

(With three illustrations on Text-Plate XXIV.)

THE following case is noteworthy, not only because of the extremely rare occurrence of echinococcus within the region of the eye, but especially because of its exceptional location with respect to this area. The typical development and rapid growth are of interest.

The patient, a young woman of twenty, was seen at the Manhattan Eye, Ear and Throat Hospital on February 25, 1923. She complained of a gradually enlarging growth on the left eyeball during the previous two months. She gave the appearance and history of general good health.

Examination showed a globular, grayish-colored cystic tumor, about the size of a pea, located over the insertion of the internal rectus muscle. The growth was covered by slightly injected conjunctiva which was quite freely movable. There was no opaque spot and no evidence of inflammation.

The cyst was excised through a conjunctival incision and the specimen referred to the hospital pathologist, whose report was as follows:

"*Macroscopically:*—The specimen consists of a cyst measuring 8 x 5 millimeters in diameter. The cyst wall measures 1 millimeter in thickness. When opened the cyst yields a thin gelatinous fluid. Upon the inner wall of one side of the cyst there is a small mass of tissue 2 millimeters in diameter. This mass of tissue is soft and adherent to the inner wall of the cyst.

"*Microscopically:*—Microscopical sections show the cyst wall composed of two layers, an outer fibrous layer and an inner granular or cellular layer. The fibrous or cuticular layer is thin and quite vascular with some areas of lymphocytes and eosinophiles surrounding the smaller capillaries.

The granular layer is quite thick and presents two distinct varieties of cells. Near the fibrous layer the cells are large mononuclear cells and a few polymorphonuclear leucocytes, with some fibroblasts. The inner part of the granular layer shows numerous eosinophiles and some polymorphonuclear leucocytes and mononuclear cells. The innermost portion of the granular layer shows a thin hyaline layer in which no distinct cells are noted. The small mass of tissue within the cyst consists of a hyaloid tissue surrounding an echinococcus brood capsule. The capsule shows various sections of a tænia scolex with suction disks and a double row of hooklets.

"*Diagnosis:*—Echinococcus cyst.

"(A. A. EGGSTON, *Pathologist*)."

Echinococcus infection is least uncommon in Iceland and Australia where man and dog are in unusually close association, and where, according to Fancher, Stevens and Theobald, a large proportion of dogs are infected with tape-worm. Within the ocular area the parasite has been known for more than a century. The first recorded case was that of J. A. Schmidt in 1801 (Weeks). Since then something over a hundred cases have been reported, and almost without exception they have been found in the orbit. The first exception to this order, a subretinal case, was published by Gescheidt in 1855. Hill-Griffith, in 1896, described a case in which the growth was in the vitreous. In 1903 Werner reported a typically developed subretinal echinococcus. Dévé, in 1921, tabulated these and three additional intraocular cases as follows: Wood (1906), Scholtz (1906), Dévé (1916). A case of echinococcus of the eyeball was reported by J. S. Evers in 1922. In 1908 Orloff had found the parasite in the upper lid.

The invasion corresponds to that of the embryo of tænia solium, except that as the mature worm is never found in man, auto-infection does not occur. The distribution, on the contrary, is in striking contrast; cysticercus occurring quite as exclusively within the globe and under the conjunctiva as does echinococcus in the orbit.

The mother cyst is formed of the laminated wall already described, containing a clear fluid free from albumin and char-

ILLUSTRATING DR. GEORGE R. HARE'S ARTICLE, "A CASE OF SUBCONJUNCTIVAL ECHINOCOCCUS."

FIG. 1.—Section of Echinococcus Mother Cyst. Low Magnification.

FIG. 2.—Section of Echinococcus Brood Capsule. Medium Magnification.

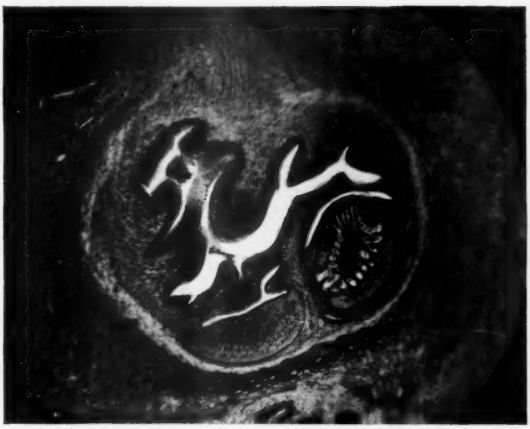

FIG. 3.—Section of Echinococcus Scolex. High Magnification.

acteristically rich in sodium chloride. The cyst may remain sterile and, according to Parsons, usually is so in the orbit. It may develop into the simple form containing brood capsules, heads and often free hooklets; or into the compound form containing in addition daughters and even granddaughters, identical with the mother in structure and function. Growth, usually, is very slow, often covering a period of years (Weeks). The size varies from that of a millet seed (Orloff) to that of an orange (Westphal).

The writer's case is an instance of a simple echinococcus cyst. Its location was most exceptional, if not unique. Because of its superficial situation, direct or local infection has been suggested and considered. This would have required the mechanical removal of the shell or its digestion by the tears. It seems therefore more reasonable to assume that because of exceptional conditions, possibly of relative diameters, the embryo passed through a muscular branch; as in Hill-Griffith's and each of the other rare intra-ocular cases, it passed through a ciliary branch of the ophthalmic artery.

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THE NORMAL RESERVE ACCOMMODATION IN PRESBYOPIA.

By Dr. F. J. SLATAPER, Houston, Texas.

(With one illustration in the text.)

THE amount of sphere added for near in an ordinary case of presbyopia depends upon three factors: the working distance, the total accommodation, and the reserve accommodation. The first two factors are determined by well-known methods. The amount of accommodation that must be reserved for the presbyope's comfort when doing close work is the subject of this paper.

Normal Reserve Accommodation Defined.

The average amount of reserve necessary for a normal person is designated as the normal reserve accommodation. In presbyopia this normal reserve accommodation is definitely related to the amount of total accommodation. (Of course, the total accommodation must be determined by actual accommodation tests, rather than by estimating it from the patient's age.) To express this relation requires three formulas, divided according to the amounts of total accommodation. The formulas refer to diopters of total accommodation. They are as follows: (a) When 1.0 or less, the normal reserve is equal to the total accommodation. (b) When 1.0 to 1.9, the normal reserve is equal to 1.0. (c) When over 1.9, the normal reserve is equal to 1.0 + (total accommodation —1.9) 0.353.

These formulas are original.

Assumptions.

My formulas for the estimation of the normal reserve accommodation are based upon three assumptions: First, An old familiar rule for the correction of presbyopia is that for certain ages a definite add for near can usually be given. To be specific Thorington (1) is quoted: "For a working, reading, writing, or sewing distance of 33 *cm.* (13 in.), the writer makes it a rule to add to the distance-correction at 45 years of age, + 1 sphere; at 50 years of age, + 2 sphere; at 55 years of age, + 2.50 sphere; and for 60 or more years, + 3 sphere." Now it is assumed that the above mentioned adds represents the average adds for those particular ages. Second, That the mean total accommodation given by Duane (2) for these ages is correct. Third, That a patient requires the same amount of normal reserve accommodation while working at 28 to 50 *cm* as he does at 33 *cm.*

Basis for Computing Reserve Accommodation.

The ages mentioned by Thorington and also that of forty are given on the top row of table "A" in separate columns. The accommodation for the respective ages as quoted from Duane is given in each column in the second line. In the third line the Average Add is placed in the proper columns. The addition of the accommodation and average add forms the fourth line which represents the total amount of refraction. A three is placed in each column on the fifth line to represent the diopters of refraction at 33 *cm.* The fifth line is subtracted from the fourth line and the difference is placed in the sixth line, which is tentatively designated as the basic average reserve accommodation. The diagram 1 of coordinates was constructed, using the total accommodation as the abscissas, and the basic average reserve accommodation as the ordinates. The seventh line of the table gives the normal reserve accommodation figured with my formulas. It closely approximates the basic average reserve accommodation in the line above. The eighth line is added merely to demonstrate that the rule of reserving one-third of the accommodation is not practical.

TABLE A.

1.	Age.....	40	45	50	55	60	70
2.	Mean accommodation.....	5.8	3.6	1.9	1.3	1.2	1.0
3.	Average add at 33 *cm*.....	0	1.0	2.0	2.5	3.0	3.0
4.	Total refraction.....	(5.8)	4.6	3.9	3.8	4.2	4.0
5.	Less 3 diopters.....	3.0	3.0	3.0	3.0	3.0	3.0
6.	Basic average reserve.....	(2.8)	1.6	0.9	0.8	1.2	1.0
7.	Normal reserve.....	2.4	1.6	1.0	1.0	1.0	1.0
8.	⅓ total accommodation....	1.9	1.2	0.6	0.4	0.4	0.3

The normal reserve accommodation is indicated by the broken lines.

Note its relation to the total accommodation. The circles marked 45, 50, 55, 60 and 70 show the basic average reserve accommodation at each respective age.

Proof of First Formula.

(a) Since a plus 3.00 sphere is the average add for those of 70 years and older, it follows that a plus 3.00 add is the average add for a total accommodation of 1.00 or less diopters. When the total accommodation is 1.0, the average reserve accommodation must be 1.0, as shown by the following two equations: (1) With 3.0 (the average add) + 1.0 (total accommodation) = 4.0 (total refraction, (2) 4.0 − 3.0 (the refraction at 33 *cm*) = 1.0, the average reserve accommodation.

When the total accommodation is any amount less than 1.0, *e.g.*, + .50 diopter, the average reserve must equal the same amount, + .50 as shown by the following two similar equations: (1) 3.0 (the average add) + .50 (total accommodation) =3.50 (total refraction). (2) In this case 3.50−3.00 (the refraction at 33 *cm*) = .50, the average reserve accommodation. From these equations it can be concluded, that when the total accommodation is 1.0 or less, the average or normal reserve accommodation is equal to the total accommodation.

Proof of Second Formula.

(b) It is to be observed that the average of the four ordinates of basic reserve accommodation associated with the

total accommodation from 1.0 to 1.9 diopters is 0.975 of a diopter. These four ordinates have a mean deviation of 0.125 from their average. Hence 0.975 diopter is a fair representative of these four ordinates of basic average reserve accommodation. Since 0.975 is practically a diopter, one diopter is taken to be the average. The man with only one diopter total accommodation seems to need as much reserve as the one with 1.9 diopters accommodation. Hence for a total accommodation from 1.0 to 1.9, the average or normal reserve accommodation is equal to 1.0 diopter, which is the second formula.

Proof of Third Formula.

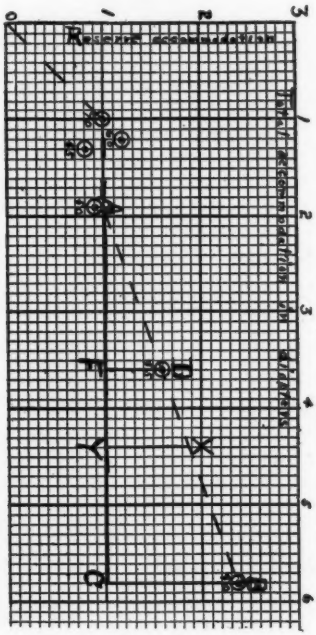
(c) This formula is more complicated. Point A in diagram 1 is determined in one direction as 1 diopter and in the other direction as 1.9 diopters, as given in the previous paragraph. The other fixed point, D, is determined by the Basic average reserve and total accommodation at 45 years. (1) A straight line drawn through these two points crosses the 5.8 ordinate at B. This was done to get the same relation of reserve to total accommodation between 40 and 45 as from 45 to 50 years. Because the decline of total accommodation from 40 to 50 years is an even steady decline, as can be seen by a plot of Duane's accommodation figures, which shows practically a straight line between these ages.

In the right triangle ABC the base and perpendicular are measurable, as the diagram was drawn to scale. (2) The length of BC is more accurately found by proportion. Since ADF and ABC are similar Triangles, then AF:AC: :DF:BC, hence $BC=\frac{AC \times DF}{AF}$. The lines AC, DF and AF represent known measurements. Substituting diopters for these terms, $BC=\frac{3.9 \times 0.6}{1.7}$ or 1.376. This places B at the same coordinates in the graph.

On the theory that line AB+1 diopter represents the normal reserve accommodation of a total accommodation from 1.9 to 5.8, it is easy to construct a formula in terms of total accommodation that will give the normal reserve accommoda-

tion between the two points, A and B, as any perpendicular XY+1. AXY and ABC are similar triangles. Hence, the

DIAGRAM 1.



proportion, XY:BC : :AY:AC. In this case $XY = \frac{BC \times AY}{AC}$ or substituting diopters for these terms,

$$\frac{1.376\ (\text{total accommodation} - 1.9)}{3.9}$$

which equals (total accommodation − 1.9) 0.353. Hence, 1+ (total accommodation − 1.9) 0.353 is equal average or normal reserve for a total accommodation between 1.9 and 5.8, which is the third formula.

USE OF NORMAL RESERVE ACCOMMODATION.

The available accommodation is obtained by substracting the normal reserve from the total accommodation. By the

standard add is meant the working distance expressed in diopters, minus the available accommodation. With these two principles and in accordance with the third assumption, the table B was constructed. The use of this table enables me to avoid some routine calculations when prescribing near glasses. For an ordinary case of presbyopia the standard add is selected. If it is intended to stimulate or relax convergence at the determined working distance, then give an add that will make the patient use more or less, respectively, of his reserve accommodation than is indicated as the normal reserve accommodation.

TABLE B[1]

PRESBYOPIC STANDARD ADD TABLE

Based on original formulas for normal reserve accommodation.

Total acc.	Nearest age	Res. acc.	Available acc.	50.0 cm	44.4 cm	40.0 cm	36.3 cm	33.3 cm	30.8 cm	28.5 cm
4.50	43	1.92	2.58				.17	.42	.67	.92
4.25		1.83	2.42			.08	.33	.58	.83	1.08
4.00	44	1.74	2.26			.24	.49	.74	.99	1.24
3.75		1.65	2.10		.15	.40	.65	.90	1.15	1.40
3.50	45	1.56	1.94	.06	.31	.56	.81	1.06	1.31	1.56
3.25		1.48	1.77	.23	.48	.73	.98	1.23	1.48	1.73
3.00	46	1.39	1.61	.39	.64	.89	1.14	1.39	1.64	1.89
2.75	47	1.30	1.45	.55	.80	1.05	1.30	1.55	1.80	2.05
2.50		1.21	1.29	.71	.96	1.21	1.46	1.71	1.96	2.21
2.25	48	1.12	1.13	.87	1.12	1.37	1.62	1.87	2.12	2.37
2.00	49	1.03	.97	1.03	1.28	1.53	1.78	2.03	2.28	2.53
1.75	51	1.00	.75	1.25	1.50	1.75	2.00	2.25	2.50	2.75
1.50	52	1.00	.50	1.50	1.75	2.00	2.25	2.50	2.75	3.00
1.25	60	1.00	.25	1.75	2.00	2.25	2.50	2.75	3.00	3.25
1.00	64	1.00	.00	2.00	2.25	2.50	2.75	3.00	3.25	3.50

[1]The writer will be pleased to mail a card containing this table to any one upon request.

It is not within the providence of this paper to decide the distance at which the patient can most comfortably do near work. This depends upon other factors as well as reserve accommodation, *e.g.*, convergence insufficiency, acuity of vision, binocular or monocular vision, character of near work, etc. Let the ophthalmologist first decide the proper distance

the patient must do his near work, and then with these formulas or table, calculate the necessary add for this distance.

Conclusions.

The normal reserve accommodation in presbyopia can be calculated from the total accommodation. In an ordinary case of presbyopia the amount of sphere added for near is obtained by subtracting the total accommodation minus the normal reserve accommodation from the working distance expressed as diopters. The use of normal reserve accommodation furnishes a norm that can be intelligently varied in prescribing the near correction for certain anomalies; such as convergence insufficiency, unequal accommodation, etc.

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REPORT OF THE PROCEEDINGS OF THE SECTION ON OPHTHALMOLOGY OF THE NEW YORK ACADEMY OF MEDICINE

By Dr. THOMAS HAYES CURTIN, Secretary.

MEETING OF JANUARY 18, 1926. DR. CLYDE E. McDANNALD, CHAIRMAN.

Dr. JOHN M. WHEELER showed a **Luetic Patient with Right Pulsating Exophthalmos which had been Preceded by Left Exophthalmos (Receded)**.

A male, 55 years, first seen November 8, 1924, complaining of constant pain in and around the left eye, and of diplopia, both of three weeks' duration. Vision normal in each eye. Right eye normal. The left eye showed impaired motility in all directions. There was proptosis of the left eye and œdema of the conjunctiva. Physical examination brought out mitral stenosis, and vascular sclerosis of the atheromatous type. Blood Wassermann 4 plus. Anti-luetic therapy was pushed and in addition X-ray treatment was given. The proptosis gradually disappeared, while the retina showed hemorrhages and optic atrophy developed. Blindness of the left eye resulted. July 19, 1925, he appeared with right pulsating exophthalmos. The exophthalmometer measurements were O.D. *23mm* and O.S. *10mm*. Vision was O.D. $\frac{11}{10}$ and O.S. nil. October, 1925, Dr. Harry A. Goalwin's X-ray report showed the following condition. Marked clouding of the right orbit; enlargement of the vertical diameter of the right optic canal since last examination, but not the circular enlargement usually found in optic nerve tumors. Compression of right sphenoidal sinus since last examination, the compression having taken place from the region of the left cavernous sinus downward and inward. The anterior clinoid processes are thinned and pushed upward. This com-

bination of anatomical changes speaks for an aneurism of the cavernous portion of the internal carotid artery and of the ophthalmic artery.

At present patient has right exophthalmos of 10*mm*. When the right eye is pressed backward with the fingers, definite pulsation is palpable. There is a bruit, timed with heart pulsations, which is heard most distinctly with the stethoscope, over the right globe. The bruit is heard next most distinctly in the right temple, but transmitted over the entire head. Pressure on the right common carotid lessens the bruit, but does not obliterate it; while pressure on the left common carotid has no appreciable effect. The patient is conscious of the bruit, but is not distressed by it; there is no pain or headache.

The eye movements appear practically normal. The veins of the conjunctiva, subconjunctiva, eyelids and temple are dilated on the right side. Both pupils are moderately dilated, the right reacting sluggishly to direct light, and the left consensually.

Ophthalmoscopic examination—O.D. Disk margin indistinct on temporal side, and an œdema of about ½ diopter elevation on the nasal side. The retinal veins are congested and tortuous. There are several small linear hemorrhages in and about the macula and in the equatorial region. O.S. There is secondary optic atrophy. Vision in the right eye is $\frac{1}{6}\frac{8}{8}$, with correction; and the left eye is blind. The field for white is moderately contracted concentrically. Probably the manifestations in this case are best accounted for by assuming a luetic process at the apex of the left orbit, which caused the left exophthalmos and loss of vision, and which yielded to treatment, allowing recession of the globe; while on the right side the pulsating exophthalmos is caused by an aneurism of the carotid artery within the cavernous sinus. The condition is essentially syphilitic.

Discussion: Dr. Arnold Knapp thought that the interest in this case consisted in the fact that it showed an independent involvement of both internal carotids. As a rule a bilateral process is the result of a lesion on one side only. He asked what effect compression of the common carotid had on the symptoms.

Dr. TYSON presented J. P., male, aged 30, with **Arterio-Venous Aneurism of the Left Cavernous Sinus**, with the following history. "On April 25, 1925, he fell about fifteen feet striking his head upon pavement—was taken to a hospital, unconscious, where he remained four weeks, unconscious half the time. Upon regaining consciousness he noticed noises and roaring in his ears, his eyes being red and protruding, with eversion of lids. A diagnosis at the time was extensive hemorrhage into the orbit. Wasserman negative. Was kept quiet in bed. During July returned to work and one morning was found unconscious in bed, remained in this condition for twenty-four hours, followed by excitement and raving for a period of four or five hours." On December 1, he came under observation at the Knapp Clinic. Vision R. $\frac{1}{10}$, L. $\frac{1}{10}$. Lateral and vertical diplopia (partial-paralysis third nerve) lower right field; retinal veins dark and dilated with slight hyperemia and œdema of disks; conjunctival veins dilated, slight chemosis of ocular conjunctiva. Exophthalmos, left eye protruded 5*mm* more than right. Bruit heard over eyes, maxillæ, temporal and mastoid regions; digital compression of either carotid stops bruit and noises in head. X-ray of skull by Dr. Goalwin shows:—

Evidence of fracture of left frontal bone extending from the frontal sinus into the roof of the orbit as far as about 2.0 *mm* in front of the optic canal, where the fracture line divides into two lines, one of which is directed down through the lesser wing of the sphenoid to the sphenoidal fissure, and the other inward to the body of the sphenoid. Optic canal normal in size and shape.

A diagnosis of Traumatic Arterio-Venous Aneurism in the cavernous sinus was made. Patient refused operation. Rest, intermittent digital compression and iodides were prescribed, under which there has been improvement in vision, with noises and exophthalmos slightly less.

DISCUSSION: Dr. JULIUS WOLFF: I would like briefly to refer to a case which is now under my observation, the interest of which centers in the etiological factor: A lady, age 51, while travelling on a train, was seized with a severe vomiting spell during which "something snapped" in her head. When seen by me three days later she presented a marked exophthal-

mos, incomplete paralysis of the 3d, 4th and 6th nerves, and slightly distended retinal veins, all on the left side. Pain in the head was intense. History of lues. Wassermann test and examination of the nose for sinus trouble were negative. No bruit. Provisional diagnosis, large infiltrating hemorrhage in back of orbit, near sphenoidal fissure. Symptoms progressed during following three days, X-ray negative. A bruit over the left eye was now present and pulsation of the globe developed, making the diagnosis of arterio-venous aneurism of the carotid clear. The left common carotid was ligated, with prompt but temporary improvement. The other carotid will be ligated later. The occurrence of an arterio-venous aneurism from a vomiting spell is certainly most unusual, and it is safe to assume there must have been a previous aneurismal weakening of the wall of the carotid, which then broke into the cavernous sinus during the attack. The late appearance of the bruit is explained by the communication at first being small.

Dr. Martin Cohen reported the following cases: (1) **Hole in macula from bullet wound in orbit.** Patient L. R., age 30, shot with a repeating revolver in the head five months ago. After shooting was struck on the head with a hammer. X-ray examination. Several large and small metallic bodies are situated in the skull and orbit. Two are in left orbit. No foreign body in cranial cavity. Marked ecchymosis of left upper lid and ocular conjunctiva. Pupil moderately dilated. Reacted sluggishly to light. Fundus details not recognized owing to vitreous hemorrhage. Vision, fingers at 6 inches. After several weeks vitreous cleared somewhat so that we recognized a distinct hole in the macula.

2. **Severance of optic nerve by bullet.** Mr. O. P., age 30, with suicidal intent, on January 16, 1922, shot himself over the right temporal region. The bullet penetrated the orbit. X-ray shows two large and several small metallic bodies within the orbit situated about 5*mm* anterior to optic canal. Roentgenograms of optic canal show fracture of canal wall. Eye examination a few hours after injury was as follows: Ecchymosis of lids and ocular conjunctiva. Vision nil. Pupil definitely dilated. Light reaction absent both directly and indirectly. Media clear. Fundus examination negative.

After seven days vision still nil. Three months after the injury proliferations of the retinal pigment were definitely seen in the macula and perimacular areas. Present examination shows the disk is diffusely greyish in color and sharply outlined with evidence of the lamina cribrosa. The retinal arteries and veins are contracted. Vision nil. Divergence of the eyeball present. This case shows that a distinct severance of the optic nerve beyond the entrance of the retinal vessels produced instantaneous blindness without any ophthalmoscopic evidence during the first week. Later optic nerve atrophy, vascular and pigmentary changes appeared.

3. **Optic Atrophy from Fracture Through Optic Canal.** A young man, J. C., age 16, was struck by an automobile, six years ago, and suffered sudden, almost total loss of sight in the left eye, followed by slight hemorrhages and neuro-retinitis. Later X-ray examination showed probable fracture through left optic canal.

4. **Sudden Loss of Sight in Left Eye of Man.** H. H., age 60, due to occlusion of retinal artery, cause not determined.

5. **Parinaud's Conjunctivitis** in patient M. S., age 28, specimen of conjunctiva removed for examination.

Dr. BEN WITT KEY presented a case of **Sympathetic Ophthalmia**. A man, age 48, who two months after the removal of a splinter of steel from his right eye, in which there had been a penetrating wound and prolapse of iris, developed a low-grade uveitis with detachment of retina, and loss of sight in the injured eye, and a similar inflammation in the other eye. Pansinusitis was diagnosed; and operation on the sinus was followed by improvement. The patient also developed a mastoiditis from which the pneumococcus capsulatus was isolated.

Since this was apparently a case of sympathetic ophthalmia, and since there has been definite improvement following each sinus operation, with final recovery, in Dr. Key's opinion, this case tends to prove the bacterial origin of sympathetic ophthalmia.

Dr. J. F. NEUBERGER, U. S. N., (by invitation), presented for diagnosis a case with **Papillœdema** and **Temporal Hemianopsia** in the right eye, and complete optic atrophy in the left. Man, age, 28, seven years ago complained of a severe pain in

the left parietal region and blurring of vision. Examination negative. In 1923, he again complained of the same symptoms. Nothing definite was done and he was discharged. In 1924 he appeared with a primary optic atrophy in his left eye. He had been in good general health. Blood and spinal Wassermann negative. Barany test normal. The only symtom was pain in the temporal region. There was optic atrophy of the left disk. Tonsils infected; removed. X-ray negative. Sella turcica normal. September last he had a slight exophthalmos of 4*mm*. Two days later a distinct papillœdema of right eye. Vision of the right eye is $\frac{4}{8}$; the left eye is nil; there is a temporal hemianopsia in the right eye.

DISCUSSION: Dr. SOMBERG thought that this was a case of frontal lobe tumor similar to several reported by Foster Kennedy some years ago.

Dr. GOALWIN discussed the case from a roentgenologist's standpoint.

DR. WHEELER said that it was a fossa tumor involving the left chiasm of the optic nerve.

Dr. DUANE—This case illustrates the importance of repeated examinations of the field in obscure conditions with nervous symptoms. In some cases limitation of the field is for a time the only evidence of intracranial involvement. He cited one such instance; a boy who died later of brain tumor. Particularly in patients with continuous headaches should we examine the field, a slight constriction of which may be the evidence of a pituitary disease which is causing the symptom.

Dr. JAMES W. SMITH presented a case of **Flat Melano Sarcoma of the Choroid with Orbital Involvement** (to be published in full).

Dr. ALEXANDER DUANE presented drawings showing a **Spontaneous Cure of a Large Traumatic Iridodialysis** caused by the impact of a bullet against the eyeball. In the course of five months after the injury the detached iris was gradually drawn down into place and the gap obliterated. The cure could not be attributed, as in other cases reported, to energetic atropinization, for this was not employed, but, in Duane's opinion, was due to repeated hemorrhages which occurred in the anterior chamber during the first week and

which presumably furnished a plastic exudate serving to bind the iris down.

Dr. ARTHUR S. TENNER reported a case of **Striæ Sub-Retinales** of the **Right Eye.** The patient, a girl of 15, whose right eye became blind about one and a half years ago. The left eye is normal. The disk and blood vessels are normal. Above the disk is a cluster of white spots (colloid excrescences). Three long, narrow, gray-white bands stretch over the background. One goes straight up from the disk, the second passes in a bow-shape to the temporal region, and the third passes horizontally to the macula. Nasally and below is a serous detachment of the retina. That these bands are subretinal is evidenced by the blood vessels crossing over them unchanged and undeviated.

The patient has a swollen knee of ten years' duration; (declared tubercular by the orthopedists). The skin reaction to O. T. was positive. There was a general but no focal reaction to the intradermal test. The co-existence of these two facts, *i.e.*, the tubercular knee and the positive test, while not conclusive, would indicate that eye lesion is a tuberculous one.

Dr. YUDKIN presented for diagnosis a most interesting fundus case which was apparently an **anomaly** of the **optic nerve head.**

The paper of the evening **Detection of Malingerers,** was read (by invitation), by Dr. Ervin Török (published in this number).

DISCUSSION: Dr. CONRAD BERENS said his experience had been limited almost exclusively to malingering in relation to military service, but it seems to make little difference where we meet the malingerer, for he has the same characteristics which have been clearly stated.

Although our diagnostic methods are refined, some patients develop symptoms, particularly those who have involvement of the spheno-palatine ganglion, which makes one hesitate ever to brand a man as a malingerer, who complains of unusual pains or other symptoms. He has seen two cases with chronic sinusitis and paralysis of convergence, who were diagnosed as malingerers, until they were examined by a rhinologist, and referred to an ophthalmologist. He thought it justi-

fiable, in some cases, to suggest some serious operation, for it has been his experience that patients who are really suffering are willing to undertake any measure for relief, whereas malingerers refuse operative intervention, or any other drastic measure, and treatment does not usually relieve them.

There have been numerous tests devised to detect malingerers and some of the best spoken of. Patients seldom attempt to simulate binocular amaurosis, but in addition to the test suggested, malingering may be detected by noting flinching if a blow is directed toward the eyes, or by covering the eyes with glass and directing a cloud of dust toward them.

Monocular blindness is frequently simulated, and for the detection of this all one usually needs is a set of prisms. Duane's test of placing a 4° prism base down in front of the alleged blind eye, while the person is rapidly reading is most useful, for diplopia will interfere with reading if both eyes can see. It is also significant to note any movement of the alleged blind eye when a weak prism is placed before it and removed while the patient fixates a distant object.

The greatest difficulty is found in determining the amount of vision a patient has when he complains of partial loss of vision in one eye, particularly if it is his only eye. It is useful to exclude the supposedly better eye, if he has vision in both eyes, by placing a plus and minus lens over it which neutralize each other, and then suddenly remove the minus lens; or Jackson's test using strong plus and minus cylinders which neutralize each other, and while the patient is reading, slowly turn the cylinders.

For malingerers who say their vision is equally poor in both eyes, or have only one eye, the Ives visual acuity test is useful for either the lines, or squares may be used and if the vision is determined, both with and without the mirror, and compared with test chart findings, it will require a clever malingerer to fool the examiner.

Malingerers who simulate defective color vision may usually be caught by using the plates in the Ishihari test, designed for this purpose. These plates have red letters on a blue background, and can be seen by patients with defective color vision and vision as poor as $\frac{5}{200}$.

Dr. SOMBERG did not think the majority of claimants were

honest especially in attempting to settle the claims. He thought with reference to malingerers, that there was a distinct racial trait, certain races being especially prone to this trait. Dr. Somberg does not think that such a thing as an eye neurosis exists except in cases showing—

1st. Associated skull injury. 2d. Anæsthesia in the involved eye. 3d. Other symptoms of neurosis.

He thinks that pathological changes in the eye not only furnish the most important evidence, but are often the only means of indicating the amount of visual loss.

Dr. J. H. ACHESON (by invitation): Many honest people are injured but by promise of gain, by coaching and learning tests for malingering by frequent examinations, become dishonest.

It is important that the examiner should not become of morbid mind and consider all claimants malingerers, or else those who are honest, will not receive their just claims, but rather in these examinations, consider that all are honest, but will bear a lot of watching.

The instillation of atropin creates latent refraction errors of which claimants are aware only after accident. These are honest but mistaken claims, or one eye may have been blind from birth.

The three usual types of malingerers are as follows:

1. Those claiming blindness in their only eye, the other eye having been lost. There is no test for this and pathology must be looked for.

2. Those passing off old injuries for new.

3. Those simulating diminished vision of injured eye, or other eye, or both eyes.

MEETING OF FEBRUARY 15, 1926. CLYDE E. MCDANNALD, CHAIRMAN. THOMAS H. CURTIN, SECRETARY

Dr. G. ALLEN ROBINSON (by invitation) read the first paper of the evening, entitled **Radium Therapy in Diseases of the Eye and Adnexa** (published in this number). The paper was illustrated by moving pictures and photographs.

DISCUSSION: Dr. LUCY LANE said that in work done at the John Hopkins University excellent results had been obtained

by the use of Radium in epithelioma, angioma and vernal catarrh.

Dr. WHEELER said that he had many brilliant results with radium therapy particularly in malignant growths; but reminded us that some cases had been reported where eyes had been lost in the use of radium in corneal conditions. The eye itself should be fully protected during the radium exposure to the growth.

Dr. KNAPP thought the crux of the radium question consisted in the standardization of treatment and the determination of exact dosage, as we are all convinced that radium is a powerful remedy, and gives good results in certain types of eye lesions. At the same time its reaction is uncertain; and on account of the varying reactions produced, some authorities prefer the use of X-ray.

Dr. CRIGLER said that he had had occasion to observe the effects of the use of radium on some of the cases treated by Dr. Robinson and that he was particularly impressed with the good results obtained in cases of epitheliomata and angiomata. He had also seen the ill effects produced from excessive radiation, resulting in atrophy of the skin, loss of celia, closure of puncta, and in one instance a diabetic, secondary glaucoma and cataract.

This instance occurred several years ago when the effects of radium on the important structures of the eye were not apprehended. The treatment was directed toward the eradication of the growth, without due consideration of its effect on the eye.

He thinks that the problem yet to be solved is one of proper dosage, which can only be determined by concert of action on the part of those using it, in reporting and results, both **successes and failure,** and an accurate record of the amount of radium used, the method of screening and distance from parts treated.

He thinks that early surgical removal is preferable to radium, when scarring and deformity can be obviated.

Dr. J. M. WEST (by invitation), formerly rhinologist to the Ophthalmological Clinic of Professor Silex in Berlin, now at the Coaldale Hospital, Coaldale, Pennsylvania, read the second paper of the evening on the **Intranasal Surgical Treatment**

of **Dacryostenosis.** He described his intranasal tear-sac operation and said the operation was indicated in all the different clinical pictures of stenosis of the nasal duct, in epiphora, in dacryocystitis, in phlegmonous conditions, in dilatation of the sac, and also in cases of lacrimal fistula. The results of the operation were shown with a series of photographs of the patients taken just before, and then again a week after the operations. All cases photographed had been followed for at least one year, and some had been under observation for a number of years after the operation. The speaker also called the attention to the fact that many cases suffering from epiphora after the usual extirpation of the sac from the outside could be cured by the intransal operation.

DISCUSSION: Dr. KNAPP: Those who were present at the recent operation performed by Dr. West at the Knapp Memorial Eye Hospital, were impressed with his dexterity and the ease with which the operation was performed. It is a very important addition to the methods of treating lacrimal obstruction, and I hope it will be seriously taken up by the rhinologists here in New York. I would ask whether in the case of dacryocystitis in a patient to be operated on for cataract, Dr. West would advise his operation rather than the extirpation of the sac. I was much interested in hearing Dr. West's observations on the results after removal of the lacrimal gland for persistent tearing. This is a subject about which we surely need further information. I believe that Dr. West has some definite views on the cause of dacryocystitis which I hope he will explain in his concluding remarks.

Dr. WEST: In answer to Dr. Knapp's question as to whether in cases of cataract combined with dacryocystitis the intranasal operation is advisable as a means of curing the suppuration preliminary to the operation for cataract, I may say that in my opinion in such cases the intranasal operation is preferable. The intranasal tear-sac operation restores the drainage from the eye into the nose, and this causes the pathogenic bacteria to disappear from the conjunctival sac, as I have found by taking cultures. A few days after the intranasal operation we find a normal bacterial flora in the conjunctiva. On the other hand, Mattice in Axenfeld's clinic found pneumococci in the conjunctiva years after the externa

extirpation. In a number of cases of cataract Professor Silex has performed the extraction after I had removed the suppuration by the intranasal operation, and in all of these cases the healing was without complications.

As to the cause of dacryocystitis, I believe we have here to do with a condition analogous to hypertrophy of the turbinates of the nose. The histological picture of a cross section through the nasal duct shows a venous plexus similar to that found in the turbinates. And just as in certain cases the turbinates begin to hypertrophy, I believe the same thing occurs in venous plexus of the nasal duct, thus leading to stenosis of its lumen.

REPORT OF THE TRANSACTIONS OF THE OPHTHALMOLOGICAL SECTION OF THE ROYAL SOCIETY OF MEDICINE.

By Mr. H. DICKINSON, London.

A meeting of the Section took place on Friday, February 12th, the President, Sir Arnold Lawson, K.B.E., occupying the Chair.

The President made touching reference to the early death of one of the honorary secretaries of the Section, Mr. M. W. B. Oliver, and a vote of condolence to his family was passed by members rising in their places. He died of rapidly developing double pneumonia.

Cases.

Mr. A. F. MacCallan showed a case of re-attachment of the retina after spontaneous detachment and operation. The patient had had no injury. A recent detachment was seen in the upper and outer part of the fundus of the left eye and this corresponded with the defect in the visual field. A puncture was made, the trephine being passed into the globe and moved through a segment of a circle, the scleral wound being opened as little as possible, the object being to effect a vent through the retina. No fluid came externally from the puncture. She was kept in bed three weeks, and at the end of that time the vision was normal. The present vision, with correction, was $\frac{6}{9}$.

Mr. M. H. Whiting spoke of three cases of the kind he had recently, in which the results were successful. The technique he used was that originated by an Italian surgeon. In this operation the sub-retinal fluid was allowed to escape from

the scleral puncture. The puncture was first made into the sub-retinal space, and after fluid had ceased to escape, the puncture was continued into the retina and vitreous. This was immediately followed by an injection of mercury oxycyanide, and, later, by injections of hypertonic saline. The successes he had had from this method were more marked than he had experienced before.

The PRESIDENT said that, whatever else might be done, he regarded puncture of the retina as an essential. He liked to trephine the sclera with the ordinary *2mm* trephine, and when he had let out sub-retinal fluid, he passed a Graefe knife through the trephine hole, sweeping it radially through the retina. This rendered wounding of retinal vessels unlikely. One could look through the pupil to see what the knife was doing, and if there should happen to be hemorrhage, it cleared up well.

Mr. MACCALLAN also showed a patient with ptosis on whom he had performed the operation of George Young, of Colchester. This procedure pleased him, and he recommended it to members. He did not see why it should not be done on the adult, under novocaine. The object of the operation was to bring about adhesion between the upper border of the tarsus and the belly of the superior rectus muscle. If, however, this muscle was not in an active condition, this operation was contra-indicated.

Mr. GEORGE YOUNG described his operation, which he designed in 1924 to relieve the disfigurement and suffering of a patient of his. Since then he had used the procedure for double ptosis, and for paralytic ptosis. He had found it very successful in all his cases, though sometimes there was a slight sagging of the outer part of the eyelid. In paralytic cases there was diplopia, but it could be corrected with prisms.

Mr. RAYNER BATTEN showed a patient with a new vessel formation in front of the iris. There was a long history of ocular defect from the 9th year, she now being about 30 years old. For some years she was blind, then she recovered some sight. Later she could not see through her glasses, and he discovered a blob going over to the temporal side, and that this was a dislocation of the lens downwards and to the nasal side, deep in the vitreous. Last year she came with what

appeared to be conjunctivitis, and the sight began to fail again and she had some tension in the eye. Last September these vessels shown began to cross the iris; they emerged from the pupil, not from the margin of the iris. There had been extensive choroidoretinitis.

Mr. HARRISON BUTLER said he had seen vessels coming out of the pupil in cases of irido-cyclitis which had persisted a long time. He thought that in this case there must be a serious lesion of the ciliary body.

Mr. G. YOUNG (Colchester) said that occasionally one saw marked vessels running over the iris in acute iritis.

Mr. P. G. DOYNE read a paper on

Ocular Torticollis.

He said this was a not very uncommon condition in children, but it was only occasionally that the deformity was sufficiently marked to be conspicuous. In nearly every case it was of congenital orgin. It must be distinguished from true torticollis. In ocular torticollis the head was tilted to one side; there was but little or no rotation of the chin to the opposite side, indeed the chin might point to the same side. There was no difficulty in straightening the head, and when this was done there was no obvious tightening of the sternomastoid. In a case recorded by Cockayne, and in all the author's cases there was clear facial asymmetry. Diplopia was not complained of when the head was in the assumed position, but was said to appear when the head was straightened. In Cockayne's case there was binocular vision.

Ocular torticollis seemed to be a posture adopted to compensate for weakness of one of the muscles which controlled eye movements in the vertical plane. The head was tilted to the side of the most dependent eye. Abelsdorff contended that the name ocular torticollis should be reserved for the cases which were due to paralysis of the superior oblique, as he maintained that the superior oblique and superior rectus acted in conjunction in performing the inwards eye rolling movement, but were in opposition in regard to movements in the vertical plane. When the superior oblique was out of action, inward rolling of the eye was performed by the superior rectus, but the associated elevation of the eye by the superior

rectus was now not opposed by the superior oblique, hence the eye squinted upwards. If the head was tilted away from the side of the paralysed superior oblique, the latter was not called upon. Abelsdorff said that the torticollis always corresponded to the side of the healthy eye. Mr. Doyne agreed with this but said ocular torticollis could certainly be caused by weakness of muscles other than the superior oblique. He had a boy aged 9 under care who tilted his head slightly to the right. He had 3D. of hypermetropia and 3D. of astigmatism, the axis of which was slightly down and to the right in both eyes. Correction did not appear to alter the tilt, but he had a right internal strabismus with slight amblyopia in the right eye. There appeared to be no limitation of movement in either eye, nor was heterophoria demonstrable with the Maddox rod.

Mr. Doyne's own cases of the condition numbered five, though in only two was the condition gross. The particulars of these two were as follow: The first was that of a girl aged 7 years who was somewhat backward mentally. Her head-tilting had been noticed since birth. It was a tilting to the right, with a slight inclination of the head to the right. On holding her head straight—an easy matter—the left eye was slightly elevated in comparison with the other. On turning the eyes to the right, this elevation of the left eye became more marked, but on turning the eyes to the left, they became parallel. Right hypophoria was brought out with the Maddox rod. The right side of the face was atrophied, and refraction showed 2D. of hypermetropia. Correction for this was supplied, but with no difference in the head-tilting. After a few months' observation, therefore, Mr. Doyne tenotomized the left inferior oblique. After this there was a marked improvement in the position of the head, nothing beyond a slight tilt being observed.

In the second of the severe cases, that of a girl aged 6, the head was tilted to the left. Hemiatrophy—on the left—was present in the face. With the Maddox rod, right hypophoria was found, and this was compensated by a prism, base down, before the right eye. She had 1.5D. of hypermetropia in each eye. Prisms did not correct the condition in two months, therefore he tenotomized the right inferior oblique. Seen

several times subsequently there was no noticeable improvement on the tilt, though the mother said she was better but was shy. He was now trying physical exercises in supplement. He discussed the mechanism probably operating in all the five cases.

Mr. L. MONTAGUE HINE regretted he had not succeeded in exhibiting a patient who had this condition. This child had had a wry-neck since birth, and at 3 months of age was taken to a children's hospital, where massage of the neck was carried out for some time, without benefit. At 3 years of age an operation was offered for the wry-neck, but it was declined by the mother. In her 8th year she was sent to the Miller Hospital, Greenwich, where she came under Mr. Roth. That surgeon said she had not got wry-neck, but her vision was defective, and sent the patient to Mr. Hine. She was then wearing plus 4 spheres, and she came in with her head tilted to the right. She had binocular vision and left convergent strabismus without glasses; with glasses the convergence disappeared. When her head was held to the right, the left eye was in the middle of the palpebral fissure, and when the head was brought round straight, the left eye turned up somewhat under the lid. He found she had, approximately, 4 prism diopters of left hyperphoria; therefore he added 2° prisms to each eye—base down in the left, base up in the right. He then sent the patient back to Mr. Roth, as she was very much better. Six months later he saw the patient again, and her mother was very pleased with the result. Eighteen months after he first saw her, Mr. Roth reported that the result was excellent, and it was difficult to demonstrate the inequality.

Mr. R. FOSTER MOORE asked whether Mr. Doyne had any theory to advance to account for the hemiatrophy of the face seen in many of these cases. The teaching had been that it was due to pressure of the sterno-mastoid and deep cervical fascia on the carotid artery, but the speaker did not regard that as a very satisfying theory.

Mr. DOYNE replied that he tried prisms before resorting to the knife, but failed with them in these two cases. With regard to causation, he took it that if this posture was adopted almost from birth, it was reasonable to expect a better blood supply on the non-tilted side than on the other.

Mr. LINDSAY REA read a paper, profusely illustrated by means of the epidiascope, on two cases of plastic repair of perforated corneæ. In the first of these, pus was pouring from the lids. He painted the lids with silver nitrate after swabbing and washing out, and on the same evening he drew the conjunctiva right across the corneæ refraining from putting bandages on the child's eye. After great patience by the nurse, who carefully washed away any secretion seen in the orbit, the conjunctiva became adherent and the secretion clear. It was now, three years after, very healthy. There was a large leucoma in the center. Astigmatism was very marked, and the sight poor. The other case was also described and illustrated. He said he had carried out the same procedure for septic ulcer.

Mr. HARRISON BUTLER referred to Kuhnt's operation of kerato-plasty, using a ribbon of conjunctiva instead of an apron as employed by Mr. Rea.

Mr. RAYNER BATTEN pointed out the advantages, in cases such as these, of the operation of peritomy.

REPORT ON THE PROGRESS OF OPHTHALMOLOGY.

Abstracts by Drs. A. N. Alling, New Haven; P. G. Doyne, London; and K. Wessely (*Archiv. für Augenheilkunde*), Würzburg.

Edited by Matthias Lanckton Foster, M.D., F.A.C.S., New Rochelle, N. Y.

(*Continued from May issue.*)

XI.—UVEAL TRACT. SYMPATHETIC OPHTHALMIA.

253. Alexander, W. **Return of pupillary reactions at not the same time after an epileptic fit.** *Med. Klinik*, 1922, No. 26, p. 831.

254. Bergmeister. **Congenital melanoma of the choroid.** *Zeitschrift f. Augenheilkunde*, xlviii., p. 34.

255. Carus, F. **A case of postoperative cystic growth in the anterior chamber starting from the posterior pigment layer of the iris.** *Archiv. f. Augenheilkunde*, xcl, 1922.

256. Clegg, J. G. **Central scotoma in anterior uveitis.** *British Journal of Ophthalmology*, 1922, vi, No. 3.

257. Cords, R. **Decoloration of the superficial layer of the iris.** *American Journal of Ophthalmology*, January, 1924.

258. Cosmettatos. **Melanosarcome primitif du corps ciliaire.** *Archiv d'Ophtalmologie*, 1921, No. 5, p. 284.

259. Curschmann, H. **Intermittent neurogenous heterochromia of the iris.** *Klin. Wochenschrift*, 1922, No. 46.

260. Goerlitz. **Ossification of the choroid.** *Klin. Monatsbl. f. Augenh.*, lxviii, p. 391.

261. Guillery. **A rare finding in sympathetic inflammation.** *Zeitschr. f. Augenheilkunde*, xcl, p. 39.

262. von Hippel. **Is early enucleation demanded without exception in cases of sarcoma of the choroid?** *German Ophthalmological Society*, Jena, 1922.

263. Hochwelker. **Un cas du gomme du corps ciliaire avec phenomenes glaucomateux secondaires. Guérison.** *Arch. d'Ophtalm.*, xxxix, 1922, No. 3.

264. Holth and Berner. **Congenital miosis or pinhole pupils owing to developmental faults of the dilator muscle.** *British Journal of Ophthalmology*, September, 1923.

265. IRONS, E. E. AND BROWN, E. V. L. **The etiology of iritis.** *Journal A. M. A.*, November 24, 1923.

266. KAUFFMANN, F. **Neurogenous heterochromia of the iris a symptom of internal diseases.** *Klin. Wochenschrift*, 1922, No. 39.

267. KEY, B. W. **Extensive unilateral chorioretinal atrophy with recurring deep scleritis.** *American Journal of Ophthalmology*, November, 1923.

268. KOBY. **Contribution a l'etude de la chrom heteropie.** *Revue gen. d'Ophtalmologie*, 1921, No. 2, p. 49.

269. KUBIK, J. **Hippus in bilateral ophthalmoplegia interna.** *Med. Klinik*, 1922, No. 18, p. 518.

270. LAMB, H. D. **Rupture of the choroid with report of two cases.** *American Journal of Ophthalmology*, June, 1923.

271. LAUBER. **Local recurrence in the orbit after enucleation because of sarcoma of the choroid.** *Klin. Monatsbl. f. Augenheilkunde*, lxix, p. 134.

272. LI, T. M. **Primary ring sarcoma of the iris.** *American Journal of Ophthalmology*, July, 1923.

273. MCLEAN, STAFFORD AND GILMARTIN, H. **Cerebrospinal meningitis with purulent iridochoroiditis, with recovery.** *American Journal of the Diseases of Children*, June, 1924, p. 603.

274. OGUCHI. **A special form of central choroiditis with remarks concerning scotoma to resembling afterimages.** *Archiv f. Ophtalmologie*, cx., p. 25.

275. ROCHE. **Chorioidite diffuse des viellards.** *Archiv d'Ophtalmologie*, xxxix, 1922, No. 12.

276. RUGE. **A case of sympathetic chorioretinitis.** *Klin. Monatsbl. f. Augenheilkunde*, lxix, p. 297.

277. SAUPE, K. **A case of congenital absence of the dilator pupillæ or of its innervation.** *Ibid.*, lxviii, 1922.

278. SCHMITT, A. **Detachment of the anterior layer of the iris.** *Ibid.*, lxviii., 1922.

279. TEULIERES. **Le sarcome de l'iris.** *Archiv. d'ophtalm.*, 1921, p. 534.

280. YOSHIDA, Y. **Vitreous membranes upon the iris with adherent Leucoma of the cornea.** *American Journal of Ophthalmology*, August, 1923.

ALEXANDER (253, **Return of pupillary reactions at not the same time after an epileptic fit**) observed the return of the pupillary reactions after the convulsions had ceased, but the patient was still unconscious. Both pupils were dilated to the maximum and without reaction. Gradually the right pupil began to react and after a few seconds reacted promptly to light, while the left remained immobile. Ten or fifteen seconds later the left pupil reacted promptly to light. The size of the pupils was the same at each time.

CARUS (255, **Postoperative cystic growth in the anterior chamber**) reports the case of a man 44 years old who had iritis of unknown origin in 1919 and had an iridectomy performed downward. In the summer of 1920 a dark brown spherical growth was found in the anterior chamber at the site of the coloboma, with several little apertures in the pigment wall through which the contents could be seen to be a clear fluid. It was clearly a benign cyst, not a solid malignant tumor. The cyst wall appeared to have come from the pigment layer of the iris, but the origin of the delicate membrane closing the apertures in the pigmented wall is uncertain.

CLEGG (256, **Central scotoma in anterior uveitis**) has observed central and paracentral scotomata in four cases or iridocyclitis with keratitis punctata. These scotomata are small, relative, sometimes absolute, and have nothing characteristic as to form. The corresponding places in the fundus were free from pathological changes. The cause was supposed to be the same toxines that caused the iridocyclitis. Two of the patients were immoderate users of tobacco.

In Japan one meets frequently with a central scotoma due in some cases to a retrobulbar neuritis, caused by beri-beri, in others to a special form of central chorioretinitis. The main symptom of the latter is a positive scotoma, with relative color scotoma, micropsia, and metamorphopsia. Sometimes an opacity of the macula may be found, disappearance of the macular ring, enlargement of the red area of the fovea centralis, and disappearance of the foveal reflex. The cause of the disease is unknown. OGUCHI (274, **Central choroiditis with remarks concerning scotomata resembling after images**) gives some of the peculiarities of this clinical picture. Positive scotomata are not always present, though they can be induced by repeated blinking. The negative scotoma appears at the moment of opening the eye as a dark disc which gradually disappears like an after image. The patient may also perceive this scotoma when he goes from the bright light into the half dark, or when he rides into a tunnel in a railroad train. Inversely one sees a dark disc in a red background in front of the closed eyes. It corresponds in its behavior to after images. This scotoma appears at the beginning of the disease and later becomes an actual positive sco-

toma. It seems to be produced by a slight exudate of inflammatory origin which causes at first only a slight opacity, later a dense opacity of the macula. A negative scotoma may be made perceptible, that is made positive, by moving a stenopaic slit back and forth before the eye. The form size and position of this scotoma is very irregular, while that produced by beri-beri is regular. It is also sharply defined. Distant vision is little impaired, near vision greatly disturbed. The light sense is reduced. Red, green and blue appear dark in the diseased area, yellow as from gray to white. The field of vision is not changed. The blind spot is often enlarged. Micropsia and metamorphopsia are often observed. The power of accommodation is weakened. The duration is short, usually a few weeks; the prognosis is good. The cause is unknown; an inflammation of the choriocapillaris is assumed to be present. It is not dependent on syphilis, or on inflammation in the accessory sinuses. The patients are often great smokers, and occasionally the disease has appeared after heavy drinking.

CORDS (257, **Decoloration of the superficial layer of the iris**) describes four cases of a peculiar form of decoloration of the iris which accompanied quite different conditions, *i.e.*, iridocyclitis, glaucoma and contusion of the eyeball. It was the superficial layer of the iris which was involved in all of the cases. The condition differed from atrophy, in that the trabecules had a normal form and size and the affected tissue appeared grayish blue. In atrophy, however, the trabecules are small and straight and the whole tissue appears thin and white. ALLING.

CURSCHMANN (259, **Intermittent neurogenous heterochromia of the iris**) reports two observations. The first patient was a neuropathic girl, formerly a telephone operator, who had received an electric shock four years before in her right shoulder and had since then suffered from a hemianæsthesia, thought to be hysterical, of the face, shoulder and arm, with paresis of the latter. The right pupil was usually larger than the left. The right iris was bright gray, contrasting markedly with the dark gray iris in the left eye. There was no difference in the pigmentation of the fundus of the two eyes. There were no other symptoms of irrita-

tion or paralysis of the sympathetic. Likewise there was no sign or history of an inflammation or disease of the iris. The patient stated that formerly the two eyes were of the same color. The case had been under observation for four years and seemed to be one of permanent depigmentation of the iris of one eye caused by a slight, functional injury to the sympathetic, probably a chronic inflammation, as this would account for the mydriasis on the same side. The second patient, who had been under observation for two years, was a man 28 years old who had an ulcer of the duodenum. He noticed that every time an attack of pain appeared in his abdomen a bright yellow spot appeared in the iris of the eye on the same side with the pain, which grew quickly to a diameter of *2mm*, with a minute blood vessel running through it. It was accompanied by no local pain, visual disturbance, or headache. The phenomenon was observed first in the right eye, corresponding to a right sided body pain, later in the left eye, corresponding to a left sided pain. It was positively asserted that the disappearance of the iris spot was accustomed to occur before the body pain passed away, so that the patient could look forward confidently to relief in a short time when he saw the color of the iris becoming normal again. The ophthalmological examination follows: Pressure pain on the right side in the epigastrium; right pupil larger than left, palpebral fissures equal; play of both pupils regular; both irides dark gray. Just above the center of the pupil in the right iris is a roundish yellow spot with indistinct margins, about $2\frac{1}{2}mm$ broad, which is visible as a bright spot at the distance of a meter. Nothing could be seen of a blood vessel. Otherwise the condition of the two eyes, including the fundus, is the same, with no inflammatory or other changes. The nervous system was otherwise normal. Treatment of the duodenal trouble was followed by improvement. The spot in the right was no longer to be seen at the end of 14 days, the iris appeared everywhere of the normal dark gray. The patient said that this time the spot disappeared unusually quickly, in four or five days.

KAUFFMANN (266, **Neurogenous heterochromia of the iris a symptom of internal diseases**) saw differences in the pigmentation of the two eyes in several patients associated with

signs of irritation of the cervical sympathetic. He believes that congenital and inflammatory conditions can be excluded in these cases, and that the heterochromia must be looked upon as acquired and neurogenous, a symptom of an irritative condition in the cervical sympathetic.

KOBY (268, **Heterochromia**) divides heterochromia into three classes: 1, that associated with congenital malformations of the iris; 2, that due to hyperpigmentation; 3, the congenital, mosaic-like form. The last may be observed in domestic animals, is occasioned by the repeated crossing of heavily pigmented and poorly pigmented individuals and is an indication of a slow depigmentation of the stock involved.

IRONS AND BROWN (265, **The etiology of iritis**) have already reported a series of one hundred cases and now give results of another similar number. The combined results are given in the following table:

	Alone	*With other infections*	*Total*
Syphilis	12	26	38
Gonococcal Infection	8	2	10
Tuberculosis	8	..	8
Dental Infection	12	15	27
Tonsillar Infection	26	27	53
Sinus Infection	1	3	4
Genito-urinary, non-venereal	6	..	6
Other Infections	3	..	3
No infection found	..	..	3
Combined Infections	..	41	41
Undetermined	..	7	7
Total			200

ALLING.

HOLTH AND BERNER (264, **Congenital miosis or pinhole pupils owing to developmental faults of the dilatator muscle**) say that congenital miosis is an extremely rare condition. Holth has only seen three cases in thirty years. These three cases form the basis of the paper. They were two sisters and a brother and they were first seen in 1897. They have been observed from time to time ever since and quite recently

one sister and the brother have died and it has been possible to examine their eyes pathologically. Holth considers that a pupil of less than *2mm*, when examined in diffuse daylight and at distant fixation, can be held to be of abnormally small size. In these three cases there could be no question of any ulterior cause for the miosis such as disease of the central nervous involvement of the sympathetic system, the influence of drugs, or associated congenital anomaly such as persistent pupillary membrane. The first case, the youngest of the two sisters, had pupils the diameters of which were well under *1mm*, the right pupil being 0.3 and the left pupil 0.5 in diameter. She was a low myope (RE −2.75, LE −1.25 with −1.5 cyl.) but she had marked spasm of accommodation corresponding to −10 dioptres. After atropinization the diameter of the pupils enlarged to *2.5mm* and the normal fundus could be well seen, the visual fields were also normal. This patient complained of headaches due to the spasm of accommodation and she has been treated continuously for 30 years by daily instillations of 0.2 per cent. scopolamin. This has relieved her symptoms and the tension has never raised above normal. The other sister had pupils of about the same diameter. She was a rather higher myope (RE −7.0, LE −8.0). She had no spasm of accommodation and in consequence no headaches. She was kept under 0.2 per cent. scopolamin for 22 years after which the mydriatic effect decreased and an iridectomy upwards was performed after which she could see better in twilight. The last case, the brother, was only seen once when aged 52 years. His pupils have the following diameters, R 0.75*mm*, L 0.5*mm*. He is emmetropic and can read J1 without glasses, presumably owing to the pinhole pupils. His only complaint is that of difficulty in seeing in the twilight. It was possible to examine the eyes of the elder sister and the brother pathologically. This was performed by Brener. In brief his findings were that the dilatator muscle was defective in its development, the chief defect being at the periphery of the iris as the muscle in both eyes was found fairly formed at the pupillary end of the iris where it lies behind the sphincter muscle. With regard to treatment, presbyopes may prefer no treatment as they can read without glasses. The chief trouble to meet is the "twilight blind-

ness." This can be met in two ways: 1. By daily instillation of mydriatics. This is especially indicated in low myopes where accommodation is not needed and in cases of accommodative spasm. 2. In cases where the accommodation should be left or in cases where mydriatics appear to be injurious, a small iridectomy upwards should be made.

P. G. DOYNE.

SAUPE (277, **Congenital absence of the dilator pupillæ or of its innervation**) made the following clinical observation on an ill nourished woman 43 years old. She had been noticed to have remarkably small pupils when only ten years old. Two years before coming under observation a diagnosis of advanced tabes had been based on the condition of the pupils. The woman worked, had trouble getting about in the dark, but had no other marked physical disturbance. A neurological examination revealed no signs of tabes. A rather full neck had no essential enlargement of the thyroid. Both pupils were slightly oval horizontally, direct reactions to light and accommodation distinctly present though slight in extent.

Nothing else worth mention on the part of the eyeballs except myopia. No dilatation of the pupils was induced by three instillations of a ten per cent. solution of cocaine within half an hour. Then atropine was tried. The reaction to light persisted for fifteen or twenty minutes, slowly growing weaker. The pupils dilated horizontally oval, the right more than the left. When the pupils were dilated a distinct folding could be seen in and directly behind the region of the sphincter, as well as a quite unimportant threadlike posterior synechia. The visual field was normal. Sensitiveness over entire body normal. No signs of trouble with the sympathetic. No ptosis. Eyes somewhat sunken, due to emaciation, but no enophthalmos. Tension of the eyeballs somewhat subnormal. The author sums up: The unimportant posterior synechiæ had nothing to do with the faulty dilatation of the pupils. This was due to a failure to function on the part of the dilator pupillæ either because of an absence of the muscle, or of its innervation; a dilating element must be present in the iris.

SCHMITT (278, **Detachment of the anterior layer of the iris**) describes the following unusual case. The patient was a

woman 74 years old who had suffered from childhood from a cutaneous eruption, neurodermatitis of Brocq according to the dermatologist. In her right, uninflamed eye was a ripe cataract. The upper half of the iris was normal in color and marking, but in the lower and outer quadrant its anterior layer was detached and floating in the anterior chamber, attached only by a few fibers to the posterior layer. The pupillary margin of the detached anterior layer was split up into fine fibres which projected either singly or in bundles into the anterior chamber. The entire tissue was somewhat swollen. The color of the detached layer was greenish gray. No injected vessels could be seen either upon the detached anterior layer or upon the posterior. No red reflex could be seen in the pupil, but diascleral illumination gave a red light in the region of the detachment. The pupil was regular in form with no posterior synechiæ. Tension normal. The possibility that this was a congenital condition can neither be proved nor disproved. The dermatologist considered any connection between it and the cutaneous disease improbable, but such connection is possible.

KUBIK (269, **Hippus in bilateral ophthalmoplegia interna**) reports the following condition observed in the eyes of a girl 10 years old, congenitally syphilitic, three months after the sudden onsert of an ophthalmoplegia interna. The right pupil was 4½*mm*, the left 8*mm* in diameter, both irresponsive to light and convergence, the right with incomplete, the left with total paralysis of the accommodation. Both pupils exhibited synchronous contractions and dilatations lasting from one to one and a half seconds, 26 to 30 times a minute. Neither light, convergence, nor any other stimulus influenced the duration or the rhythm of the contractions.

MCLEAN AND GILMARTIN (273, **Cerebrospinal meningitis with purulent iridochoroiditis**) report a case in which complete recovery of sight was procured. The favorable result was attributed to the vigorous treatment with anti-meningococci serum given by the intravenous as well as by the intraspinous route. ALLING.

LI's (272, **Primary ring sarcoma of the iris**) case involved the whole periphery of the iris with extensions into the anterior portion. The ring formation was suspected before enu-

cleation as there was a pigment tumor in the upper outer quadrant and numerous spots of pigment on the rest of the iris surface. There was cupping of the optic disk. The glaucoma evidently was due to the blocking of the filtration angle. Li has found but five cases of ring sarcoma of the iris and five cases of the ciliary body but has overlooked at least three others, one of which was reported by the reviewer in these ARCHIVES, Vol. XL. ALLING.

TEULIERES (279, **Sarcoma of the iris**) reports a case of tumor of the iris which had developed without pain in the course of four years in a woman 65 years old. Loss of vision first brought the patient to the physician. The tumor formed a brown mass filling nearly the entire lower half of the anterior chamber and rested on the iris. Otherwise there was nothing special about the eye. Enucleation in January, 1920. No metastasis up to the time of reporting. The tumor was found to be a lymphosarcoma with secondary pigmentation which had involved the sclera and Schlemm's canal.

COSMETTATOS (258, **Primary melanosarcoma of the ciliary body**) reports a case of this nature and ascribes its origin to two positively observed contusions. The tumor was composed of small round cells which originated from the endothelia of the blood vessels and were for the most part degenerated and necrotic. The necrosis was perhaps explanatory of the markedly slow growth of the tumor and of its benignity. No recurrence or metastasis has appeared at the end of two years.

HOCHWELKER (263, **Gumma of the ciliary body**) describes a case of gumma of the ciliary body which appeared four years after a typical mixed chancre. The eyeball was congested, the pupil moderately dilated. When the patient looked down and the upper lid was raised an oval, black tumor, *½cm* in diameter and impervious to light, could be seen. The tension was *40mm* Schiötz, the vision was reduced to a minimum, and a shallow glaucomatous excavation could be seen with the ophthalmoscope. Energetic anti-syphilitic treatment was instituted and had produced a distinct improvement at the end of a month and a half, while it had caused slight hypertonic and scleritic symptoms in the other eye to disappear within a few days. At the end of three months full

vision was attained, the ectasia had disappeared, and no excavation of the papilla was visible with the ophthalmoscope. The perimeter showed a nasal contraction for white and a concentric contraction for red, blue, and green.

YOSHIDA (280, **Vitreous membranes upon the iris with adherent leucoma of the cornea**) describes a number of cases of adherent leucoma which showed peculiar pits in the iris characterized by yellowish-brown color and covered by a homogeneous membrane which stained with eosin. The connection of the membrane with the underlying tissue is quite loose. The free upper surface was mostly bare but in places is covered with single rows of pigment cells. The existence of the vitreous membrane in the anterior chamber is well known and has been accredited to the extension of the endothelial cells in Descemet's membrane and their power to reconstruct vitreous membrane but in these cases there was no connection with Descemet's membrane. The author believes that the vitreous layers on the iris did not originate from the endothelium of the cornea but from the cells of the iris although existence of such cells is still in doubt. ALLING.

BERGMEISTER (254, **Congenital melanoma of the choroid**) reports a case met with in a girl 11 years old. It formed a sharply defined spot about 3 p.d. in diameter in the outer equatorial region somewhat above the horizontal meridian. There were no changes in its neighborhood which indicated inflammation, but there were little melanotic spots separated from the main one by healthy tissue. There was no protrusion. The fundus elsewhere was poor in pigment. Vision was perfect. Magitot called the cells of the melanoma nævus cells, but Fuchs maintained that the spots were composed of chromatophores which had lost their shape in consequence of the increased amount of coloring matter they contained. It is not proven that the melanomata can take their origin from the pigment epithelium.

GOERLITZ (260, **Ossification of the choroid**) found an eye of normal size lined by true spongy bone with bone corpuscles and Haversian canals. The choroid and retina were much degenerated. The choroid was not the site of the ossification. The ciliary body was free from bone, but the latter was present in the partly cicatrized vitreous.

VON HIPPEL (262, **Is early enucleation demanded without exception in cases of sarcoma of the choroid?**) questions whether it is justifiable to enucleate the only eye, or the only eye with useful vision, because of sarcoma of the choroid as long as it is sufficiently useful to permit the patient to carry on his work. This question he raises because the study of a large amount of material, both from his own experience and from the literature on the subject, seems to show that the outlook for a cure is no worse, and the danger of metastases no greater, when the enucleation is performed in the second stage than when it is done in the first. He also considers the view that persons whose cure has lasted three or four years may be regarded as with overwhelming probability permanently cured is erroneous, as twenty-five per cent of the cases under observation from five to thirty years have died of metastases.

LAUBER (271, **Local recurrence in the orbit after enucleation for sarcoma of the choroid**) had removed the eye three years before from a man 78 years old, who had returned to him because of a cataract in the other eye. In the empty orbit were two dark, freely movable nodules. The orbit was exenterated, the nodules found plainly confined to the tissue of the orbit. The bones were not affected. Melanin did not disappear from the urine, as was to be expected in the absence of another metastasis.

KEY'S (267, **Extensive chorioretinal atrophy with recurring deep scleritis**) patient gave the history of repeated attacks of inflammation of the sclera which affected the retina and choroid probably by continuity. The process involved not only the anterior sclera but the posterior also as evidenced by proptosis and fundus lesions. The ophthalmoscope showed atrophy of the choroid and retina, vessels attenuated, beaded and irregular with evidence of perivasculitis. There were streaks of organized exudate and scattered pigment. Repeated Wassermanns and tuberculin injections and search for focal infection proved negative. The etiology is obscure.

ALLING.

After discussing the general subject LAMB (270, **Rupture of the choroid**) reports two cases of indirect rupture, one showing four branches, the other thin lines which passed out toward the periphery of the choroid. ALLING.

ROCHE (275, **Diffuse choroiditis of old age**) describes four cases. The disease makes itself manifest subjectively by a sudden and increasing impairment of vision, objectively by inflammatory changes at the posterior pole. Punctate chorioretinitic patches remind one of the picture of syphilis, which could be excluded in all the cases together with all forms of general disease which might be brought into connection with the clinical picture. The fundus could be seen badly or not at all in consequence of vitreous opacities, while the anterior segment of the eye was seldom involved. The prognosis is relatively good, except for the tendency to recurrence. Treatment with iodine, mercury and salicylic acid had little influence on the course.

GUILLERY (261, **A rare finding in sympathetic inflammation**) observed the onset of a sympathetic inflammation in a tuberculous man 30 years old who had been wounded by a fragment of a bomb four years before. In the enucleated eye were found the signs of a sympathy producing inflammation together with peculiar spherical or roundish bodies which were attached to the inner surface of the choroid, or floated about in the subretinal space beneath the detached retina. These bodies showed a fine, regular and radiating striation which did not start from the centre, but from various places in the interior. They bore a certain resemblance to actinomyces, which were not present. They came from the pigment epithelium, in the same way as Dalen's bodies. In the latter pigment and nuclei gradually disappear and a transformation into a sort of connective tissue takes place, in the larger nodules into true connective tissue with vessels. In these bodies a different transformation took place in that necrosis started in the centre. Then came the fine striation. The nucleus of these bodies seems to resemble mucin, colloid, or hyalin. The spherical form existed only where there was plenty of room, elsewhere the shape was changed more or less, flattened and blended. Where blending happened the pigment layer covering this place was lost. The spherical bodies tend to separate themselves from their bases. Later came calcification at the centers of the striated formations, so that frequently several calcified nuclei exist. They have nothing to do with colloids of the vitreous lamella, and

nothing was found in literature which corresponded to them.

RUGE'S (276, **A case of sympathetic chorioretinitis**) patient, a boy, was wounded by an arrow. Six months later sympathetic inflammation set in which was cured by inunctions and injections of salt after removal of the injured eye. But the inflammation recurred twice, the last time as a purulent iritis. A quick recovery followed the use of caseosan. Little nodules formed in the iris, which disappeared under treatment with Rosenbach's tuberculin. Now the patient has been free from inflammation for a year. Vision is $\frac{1}{3}$. Little choroidal patches can be seen in the periphery of the choroid.

XII.—RETINA AND OPTIC TRACT.

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283. BARTELS. **Tuberculous papillitis.** *Klin. Monatsbl. f. Augenheilkunde*, March, 1922, p. 387.

284. BECK. **Embolism of the central artery of the retina consequent upon the formation of a traumatic aneurysm of the common carotid on the same side.** *Zeitschrift f. Augenheilkunde*, xlviii, p. 31.

285. BENEDICT, W. L., AND MUSSEY, R. D. **Detachment of the retina in a case of pregnancy with nephritis. Reattachment and restoration of vision.** *American Journal of Ophthalmology*, April, 1923.

286. CANDIAN. **Septic embolism of the retina following extraction of a carious tooth.** *Klin. Monatsbl. f. Augenheilkunde*, August-September, 1922, p. 170.

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297. KOBY. **Hemianopsie inferieure monoculaire avec alterations retinieues visibles surtout à la lumière anerythre.** *Ibid.*, 1921, 6, p. 365.

298. KRASSNIG. **Rhinogenous retrobulbar neuritis.** *Archiv. f. Ohren-, Nasen- u Kehlkopfkrankheiten*, cix., p. 175.

299. LAGRANGE. **De l'atrophie optique hereditaire.** *Arch. d'ophtalm.*, xxxix., 9, 1922.

300. LOEHLEIN. **Blinding by migraine.** *Klin. Monatsbl. f. Augenheilkunde*, March, 1922.

301. MERZ-WEIGANDT. **A case of neuroretinitis consequent upon cryptogenous staphylococcic infection.** *Ibid.*, November, 1922, p. 666.

302. MOORE, F. **An unusual case of renal retinitis.** *British Journal of Ophthalmology*, May, 1922.

303. MUSKAT, IRVING I. **Lipæmia retinalis.** *American Journal of Ophthalmology*, April, 1924.

304. NARDIN, W. H., AND CUNNINGHAM, R. S. **Familial retino-cerebral degeneration.** *Ibid.*, June, 1923.

305. OHLY, J. H. **Treatment of Intraocular foreign bodies.** *Ibid.*, March, 1924.

306. ORLANDINI. **Sul distacco retinico da causa albuminurica.** *Annali di ottalmologie e clinica oculistica*, 1922, 6–9.

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309. SMITAL. **A case of senile degeneration of the macula.** *Zeitschrift f. Augenheilkunde*, xlviii., p. 37.

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311. VACHER AND DENIS. **A propos d'un cas de Syndrome hypophysaire traite par la radiotherapie.** *Archiv d'Ophtalmologie*, xxxix, 11, 1922.

312. WAGNER, HENRY P. **Retinitis and renal function in cardiovascular renal disease.** *American Journal of Ophthalmology*, April, 1924, p. 272.

313. WILLIAMSON. **Two cases of thrombosis of the retinal vein, one showing a hole, the other a star at the macula.** *British Journal of Ophthalmology*, vi., 2, 1922.

314. WIRTZ AND LIEBERMEISTER. **Sudden monocular blindness in consequence of acute œdema of the retina.** *Klin. Monatsbl. f. Augenheilkunde*, July, 1922, p. 45.

315. Woods, A. C., and Dunn, J. R. **Ætiologic study of a series of optic neuropathies.** *Journal of the A. M. A.*, April 21, 1923.

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Aubineau and Opin (281, **Glioma of the retina appearing as an iridocyclitis with involvement of the ciliary body and iris, and buphthalmia**) report a case of this nature, which was not recognized as such at first. The left eye of a child 2½ years old became inflamed, with a mixed injection and a very cloudy anterior chamber. These symptoms disappeared after subconjunctival injections. Four months later severe inflammation with an enlargement of the eyeball necessitated enucleation. A glioma was found occupying the inner layers of the cornea, iris and ciliary body, the anterior chamber filled with masses of tumor tissue resembling a hypopyon. The resistance of the pars ciliaris retinæ to the tumor cells was notable. The cloudy conglomerate in the anterior chamber had given rise to diagnostic errors.

Ballantyne (282, **The diagnosis of subretinal tumor**) suggests to introduce a discission needle through the sclera at the place where the presence of a tumor is suspected and feel for the resistance given by a tumor. In this way he diagnosed a sarcoma of the choroid in a woman 46 years old who had a detachment of the retina.

Beck (284, **Embolism of the central artery of the retina consequent upon the formation of a traumatic aneurysm of the common carotid on the same side**) tells of a soldier wounded in 1915 by a bullet in the left side of the neck. Since 1916 he has had a pulsating tumor in the left side of the neck which increased in size, with weakness of the left arm. In 1917 a motor aphasia was added, rendering it impossible for him to read or write. He also suffered from epileptic fits. In 1918 the entire right side of his body became paralyzed. In 1919 the left eye suddenly became blind. A year and a half later the left eye was blind, the pupil immobile, the papilla pale, the arteries small. Operation revealed an aneurysm of the left common carotid, and it was sup-

posed that this aneurysm was the source of an embolus of the central artery.

CANDIAN (286, **Septic embolism of the retina following extraction of a carious tooth**) reports the case of a patient 40 years old who had a lower molar extracted. During the night he had pain and a chill, followed by a fever which lasted three days and then had an impairment of his vision. In the macula could be seen a swollen white spot with little hemorrhages. During the following days appeared iritis, hypopyon, chemosis, and opacities of the cornea and of the vitreous. Gradually the cornea and then the vitreous cleared up, the retinal exudate became flattened and defined and the vision improved. The patient had been tuberculous for a long time, but at this time was apparently healed. Candian thinks this was a case of septic embolism of the eye because the fever and the iridocyclitis followed immediately after the extraction of the tooth. The good result is remarkable, as in the cases heretofore published septic emboli have always induced either panophthalmitis or phthisis of the eye.

GOURFEIN-WELT (291, **Retinitis following ethmoiditis**) saw in a woman 40 years old suffering from purulent ethmoiditis the development of an extensive retinitis on the same side with marked involvement of the inferior temporal vein. The optic nerve was intact. The writer inclines to the view that this was a case of retrograde venous embolism starting from a thrombophlebitis in the region of one of the ethmoidal veins.

WILLIAMSON (313, **Two cases of thrombosis of the retinal vein, one showing a hole, the other a star at the macula**) found in his first case, which he examined histologically, a cyst which had formed in the macula in an œdema between the external limiting membrane and the pigment layer of the retina. The layers of the retina over this had degenerated so as to form a hole in the macula. In the second case, which was likewise one of thrombosis of the central vein, a diffuse exudate had formed between the choroid and the layer of rods and cones; the macula here had undergone marked cystic degeneration from the great accumulation of œdematous fluid so that a stellate figure was seen with the ophthalmoscope. If the second eye had been preserved

longer it is probable that the retina at this place would have broken down completely and that a single large cyst would have been formed. These things occur in the macula because the choriocapillaris is thickest, and processes of exudation are therefore most active at this point. There had been no previous injury in either case.

BENEDICT and MUSSEY (285, **Detachment of the retina in a case of pregnancy and nephritis**) report a case in which premature labor was induced because of nephritis and œdema of the retina which threatened loss of vision. The next day detachments were observed in the lower half of each eye. Recovery took place with nearly normal vision.

ORLANDINI (306, **Detachment of the retina in albuminuria**) reports four cases. The first was one of nephritis in pregnancy in which the upper temporal quadrant of the retina was detached. Reattachment leaving no trace followed the disappearance of the nephritis symptoms. Two later recurrences (of pregnancy?) with albuminuria brought back the same trouble, which disappeared again each time under treatment for the renal disease, until finally sight was lost through vitreous opacities. The three others were cases of chronic interstitial nephritis with retinal hemorrhages and extensive detachments. The retina was detached from the choroid without folds and tears. Treatment of the disease caused reattachment for a time with a temporary restoration of vision. The detachment of nephritis with pregnancy has a good prognosis, while that of chronic nephritis and hypertrophy of the left ventricle commonly is accustomed to indicate approaching death, the same as retinitis albuminurica.

WAGNER (312, **Retinitis and renal function in cardiovascular renal disease**) from his study of eighty cases concludes that the type of nephritis cannot be diagnosed by the retinal œdema, hemorrhages, exudate or arterio-sclerosis seen in the fundus. Neither does this picture always signify nephritis. Retinitis of hypertension plus nephritis may indicate temporary renal insufficiency with a capacity for rapid return to normal and retinitis of a nephritic type may mean progressive renal insufficiency or functional conditions with malignant hypertension. ALLING.

HARDY'S (293, **Lipæmia retinalis; effects of insulin**) case was

brought to the hospital in a state of coma but recovered under the use of insulin. The appearances of lipæmia retinalis —blurred nerves and pale vessels—disappeared in a few days.

ALLING.

KOBY (296, **Acute chorioretinitis of the macula**) reports a rare case of this nature, which was of an inflammatory character and ran a quick course. The other eye was slightly affected. A healthy woman 28 years old had noticed shortly before coming under observation a sudden loss of vision in one eye. The ophthalmoscopic picture was as follows: Papilla well defined, vessels not abnormally injected. In the region of the macula was a bright yellow, oval mass, elevated two or three diopters above the surface, and having upon it two small hemorrhages. In its neighborhood were several hemorrhages from both arteries and veins. The superficial layers of the retina were folded raylike about the macula. At the posterior pole there was a slight cloudiness, otherwise the fundus was normal. The tension was somewhat subnormal. Externally the eye presented nothing of importance. The temperature, urine and blood were normal. Some days later four little yellowish spots without pigmentation were to be seen near the fovea centralis of the other eye. A month later there was distinct improvement. Examination in red free light showed the above mentioned radiating figure together with a slight yellowish scar in the macula and little whitish spots in its neighborhood. In the other eye the little spots had become pale and had not enlarged. The eye first affected had normal limits to its visual field and an absolute central scotoma. This case presents essential differences from those reported by Coats, Jensen, Wecker, Landolt, Gradle, and Hepburn, in both the course and the ophthalmoscopic picture.

SMITAL (309, **Senile degeneration of the macula**) reports the case of a man 64 years old, healthy except for a well marked arteriosclerosis. The vision of his right eye had been bad for four years, that of his left for three. In the region of the macula in both were glandlike spots, partly raised, frequently containing glistening inclusions. In addition there was atrophy of the pigment layer and sclerosis of the central vessels. The vision of the right eye was reduced

to 6/18, that of the left to counting fingers. A central ring scotoma was present in the right.

Much discussion has taken place regarding the classification of these cases. NARDIN and CUNNINGHAM (304, **Familial retino-cerebral degeneration**) distinguish, first, the form of amaurotic family idiocy which proves fatal, and second the retino-cerebral type which appears at the time of the second dentition, and finally those cases beginning in later life showing only the retinal changes and not the imbecility which belongs to the cases appearing earlier. Five cases of the second type are reported as occurring in a family of nine children. The disease began at about the seventh year and showed pigmentation of the macula complicated by epilepsy and progressive mental degeneration. Whether these cases are due to some inherited lack of resistance of the germ plasm or to a toxic condition it is impossible to state. ALLING.

KOBY (297, **Hemianopsia inferior with visible retinal changes**) reports the case of a man 40 years old who had observed for twenty years transient obscurations of his left eye which for about a month had become a hemianopsia inferior. The upper retinal arteries were for the most part obliterated and appeared as fine, white cords; the veins were unchanged. With ordinary light the retina presented nothing else of note, except an absence of the foveal reflex, but with red free light it was noted that in the region of the vascular disturbance the markings of the nerve fibers were lacking and that while the yellow zone of the macula was present its margins were less distinct than normal.

LOEHLEIN (300, **Blinding by migraine**) reports a case of blinding by a vascular spasm during an attack of migraine. A man had suffered from severe migraine for twenty years; in 1916 his left eye, in 1920 his right eye became suddenly blind. The right eye presented the combined picture of thrombosis of the veins and arteries with central hemorrhages, retinal œdema and vascular trouble. The left eye had plainly been blinded in the same way. Improvement was finally obtained in the right. The cause was thought to be a thrombosis of the retinal arteries, followed by one of the veins, induced by long continued spasm in the retinal arteries.

MOORE (302, **An unusual case of renal retinitis**) reports

the case of a man 45 years old whose history began seven and a half years before with a bilateral albuminuric retinitis without the typical stellate figure, but with marked exudation in the region of the macula and hemorrhages. His blood pressure at the time was 215*mm* Hg., his heart was hypertrophied, he had much albumin in his urine, but no œdema. Soon a flat detachment of the retina appeared in both eyes, which became completely reattached at the end of eight weeks. Nine months later the veins which had been small were dilated and showed a whitish sheathing. About six months later only scattered spots of exudate were visible in the fundus with some fine, black pigment in the periphery. After still another year the only things demonstrable in the fundus were a slight atrophic discoloration of the papilla and here and there a trace of an exudate or of a hemorrhage. The vision of the right eye was $\frac{6}{18}$, that of the left $\frac{6}{60}$. The blood pressure fluctuated between 210 and 235. In this condition the patient had worked for about five years, when he suddenly died in uræmia, with a blood pressure of 265, from chronic nephritis.

The left eye of WIRTZ and LIEBERMEISTER'S (314, **Sudden monocular blindness due to acute œdema of the retina**) 19-year-old patient suddenly became blind. The fundus was covered by a thick, white foamy layer, with the exception of a small temporal sector of the papilla. The macula appeared like a white tumor with a black spot in the place of the fovea centralis. The blood vessels appeared normal. This white, tumor-like formation gradually disappeared, the brownish central spot sank. About the latter ran two concentric white rings with the black fovea in their center as in a bag. The papilla became free, but atrophic. Little hemorrhages, present from the beginning, increased in the course of the observation, the blood columns of the arteries became threadlike, while the walls became enormously thickened, the entire retina shimmered with double lined reflexes, and the macula finally became visible as a hole with a brownish red, rough base. No cause for the disease was revealed by a general physical investigation. It is suggested that this was a case of acute œdema of the retina, analogous to the acute œdema of the skin and mucous membranes of Quincke.

MUSKAT (303, **Lipæmia Retinalis**) reports a case in which the blood findings were typical of this condition. The patient was a diabetic and gave a history of being a heavy drinker. After treatment with insulin the lipæmic appearance of the blood gradually diminished in intensity and only a faint trace remained at the time of the release. ALLING.

OHLY (305, **Treatment of intraocular foreign bodies**) relates the histories of numerous interesting cases in which he has succeeded in removing the foreign body from the interior of the eye. He favors the posterior route. ALLING.

Two or three days after ignipuncture of the region of Schlemm's canal to diminish filtration in the anterior segment of the globe, PESME (307, **Late effects of efforts to increase the ocular tension**) saw a great increase of tension. The tension fell gradually to normal or below in the course of a month. The final condition was reached in about six months, when the scar had consolidated. In eighteen out of twenty-two cases of detachment of the retina in myopes this procedure resulted in a permanent increase of tension. In twelve the retina became reattached with improvement of vision and of the visual field. Pesme recommends a pericorneal cauterization in highly myopic, hypotonic eyes as a prophylactic measure against detachment of the retina.

MERZ-WEIGANDT (301, **Neuroretinitis consequent upon cryptogenous staphylococcic infection**) reports the case of a man 24 years old who felt pain in his eye and the next day noticed an impairment of vision. Floating opacities were to be seen in the vitreous. The papilla presented a grayish white exudate which passed over into the retina. Wassermann negative, tuberculin weakly positive. Numerous cocci were found in the urine, from which a pure culture of staphylococcus aureus was obtained. In answer to questions the patient stated that he had had pain in the neck for four or five days before the attack. Staphylococcus aureus was obtained in smears and cultures from the tonsils, but not from the blood. Tonsillectomy was performed, pregol was used intravenously, and recovery took place in a few months. Merz-Weigandt believes the neuroretinitis was caused by a hæmatogenous infection with cocci from the diseased tonsils.

In SCHEERER'S (308, **Fulminating blindness in a child**)

case a child 3 years old had been blind for some hours with immobile pupils and many floating opacities in the vitreous. The papillæ were rather indistinct, the left eye presented peripherally a grayish yellow prominence of the retina and choroid. Recovery with perfectly normal fundus in two months. Etiology obscure.

SUGANAMA (310, **Pathological changes in recurrent juvenile hemorrhages into the retina and vitreous**) examined an eye which had suffered from recurrent hemorrhages into the retina and vitreous, taken from a man 24 years old who had died of phthisis with hemorrhages. During the preceding year the patient had suffered from hemorrhages in both eyes, which had recurred four or five months before his death. The cornea, iris and ciliary body were normal. The retina was detached on the temporal side to the ora serrata, on the nasal side to a less degree, with laminated blood between the retina and the choroid, and also in the vitreous. Periphlebitic changes were present everywhere in the retina. On all the larger and many of the smaller veins were deposited masses of cells, consisting of pale, epithelioid cells with lymphocytic infiltration, and Langhan's giant cells. The infiltration of lymph cells penetrated into the walls of the veins, which finally disappeared entirely in the tubercle. The infiltration caused also a proliferation of the endothelium of the vessels by which the lumen was narrowed and frequently closed. The choroid was free except for a single tubercle in the middle layer. Necrotic processes nowhere, on the contrary tendency to fibrous transformation. Tubercle bacilli were not found. Suganama thinks this was a case of hæmatogenous infection of the retina from a patch of tuberculosis in the lungs. Repeated hemorrhages into the vitreous had resulted in a white membraneous tissue in the vitreous, retinitis proliferans. The cases examined by Fleischer and by Axenfeld-Plucher agree throughout. The condition is a true tuberculosis of the vessels of the retina, periphlebitis tuberculosa.

WOODS and DUNN (315, **Ætiologic study of a series of optic neuropathies**) report on their study with reference to the course of 86 cases of affection of the optic nerve. Thirty-five were caused by syphilis, the predominating type being optic atrophy. Eleven cases could be traced to disease of the ac-

cessory sinuses, four being in the acute and seven in the chronic stage. The patients with the acute sinusitis all presented the same picture, that is, retrobulbar neuritis. The chronic cases had primary atrophy of the papillomacular bundle. All of the sinus cases were due to involvement of the posterior ethmoids or sphenoids. The other cases of the series were caused by brain tumor, multiple sclerosis, toxic and miscellaneous causes. ALLING.

BARTELS (283, **Tuberculous papillitis**) has observed in five men between the ages of 20 and 45 years, a papillitis in which the results of investigation seemed to show tuberculosis to be the only possible cause. All recovered after prolonged treatment with tuberculin. Four of them had a white splash centrally, as in albuminuric retinitis. In one a tuberculous iritis set in during the treatment.

CHAILLOUS (287, **Papillary stasis and decompressive craniectomy**) is convinced that many cases of choked disc may be saved from blindness by a decompressive craniectomy when the ophthalmoscopic diagnosis has been made in time and valuable time has not been lost by palliative measures. He recommends lumbar puncture only in cases of intracranial lack of space of traumatic or inflammatory origin, and puncture of the ventricles in cases of neoplasm, but this has only a very transient effect.

Out of a hundred cases of choked disc CORDS (288, **Carcinoma of the optic nerve**) found one which departed wholly from the usual picture in that the vision fell very rapidly to almost total blindness. This was in a woman 49 years old, who had undergone resection of the stomach for carcinoma two years before. Death followed four months later. The histological examination of the brain and optic nerves showed a general carcinomatosis of the soft membranes of the brain. The carcinoma cells had proliferated in the sheaths of the optic nerves up to the lamina cribrosa and almost completely filled the intervaginal space. In places the cells had penetrated the optic nerves along the septa and lay there in three neighboring rows. In places were little infiltrates of round cells. Staining of the medullary sheaths revealed no degeneration of the optic nerves. The inner membranes of the eye were perfectly normal.

DODD (289, **Double choked disc with recovery following trauma**) describes an interesting case in which surgical intervention was decided upon to relieve the cerebral symptoms. Before the operation was performed, the child fell against the porch bruising her head and in the course of about a year's time, the cerebral symptoms disappeared. The observer thinks that a benign cyst was probably responsible for the pathological picture and the condition was alleviated by the rupturing of the cyst at the time of trauma. ALLING.

DOYNE (290, **The scotomata of tobacco amblyopia**) describes three types of these scotoma. In the first there is a short, fingerlike prolongation of the blind spot toward the point of fixation. In the second there are two absolute scotomata, one of which increases the area of the blind spot, while the second, smaller one lies near the fixation point. Between these there is a relative scotoma. The third variety is a broad, absolute scotoma from the blind spot to the fixation point. The first type is met with in the milder cases, the third in the worst. The form of the scotoma is about the same for all colors, varying only in size. In general blue agrees with white, red with green. The scotoma for red is the most extensive, except in very mild cases. In twelve cases he has been able to observe the scotomata described for six months more or less constantly. He adds that he has noticed after images for red, green and blue in patients with tobacco amblyopia.

HARBRIDGE'S (292, **Optic atrophy manifested by visual disturbance following distant hemorrhage**) case was a woman aged 40 who had suffered from epistaxis all her life. Three months before the birth of twins she had a serious nasal hemorrhage which was followed in a few hours by the loss of sight. The vision gradually improved to practically normal. Eleven years later another hemorrhage occurred accompanied by some loss of vision. At the time of examination the vision was R. 5/7.5, L. 5/60 with contracted fields. Both nerves were atrophic. ALLING.

HESSBERG (294, **Irradiation of hypophyseal tumors**) reports four cases of probable hypophyseal tumors which were materially improved by the X-rays in a few sittings. Three of the four had bitemporal hemianopsia, one with double choked disc, the remaining three with partial or total single or double

atrophic discoloration of the papilla. By the irradiation the general condition and the vision were both improved. No harm was done by the irradiation. Prolonged observation showed the improvement to persist. The results of irradiation would seem to be better than those of operative treatment.

VACHER and DENIS (311, **Hypophyseal syndrome treated by radiotherapy**) reports the case of a boy 11 years old who presented a hypophyseal syndrome and was cured by the X-rays. The patient showed the ophthalmoscopic picture of postneuritic atrophy, the field was concentrically contracted, to a greater degree in the upper half, without hemianopsia. The Wassermann was negative and there were no signs of a brain tumor. At first the vision was improved by means of mercury and lumbar puncture, but with the onset of a general adiposity the vision soon became bad again. After organotherapy had been tried without benefit the region of the hypophysis was subjected to irradiation in thirty-one sittings. The result was restoration of function. The roentgenogram left it uncertain whether the condition was hypophyseal or parahypophyseal.

ICONOMOPULOS (295, **The ophthalmological point of view concerning the indications for and the results of operations in diseases accompanied by choked disc**) asks the following questions. Should immediate operation be advised in bilateral choked disc as long as the vision shows no deterioration? What is the prognosis for vision when an operation is performed for choked disc with simultaneous impairment of sight? In choked disc with blindness is a return of vision no longer to be hoped for, or may one still not give up all hope? The first question is the most difficult to answer. First every aid to a thorough examination must be employed to clear up the nature and the seat of the lesion. A characteristic symptom of a brain tumor is an intermittent obscuration or blindness, which usually lasts only a few seconds, but leads the patient to the physician. In these cases an energetic treatment with arsenobenzol may be tried with constant observation of the vision and the papilla; if no benefit is obtained after about three weeks, a decompressive operation should be performed even if the vision is normal. The danger of a sudden and absolute loss of vision in the course of the

conservative treatment exists, but it is not greatly to be feared because of its rarity. The second question is answered more easily. The earlier the operation is performed, the better is the result. In most cases no impairment of vision follows, even in the presence of far advanced disease, or of new growths which involve the optic tract. Not rarely a normal vision is regained, and generally the papillitis disappears more or less quickly, sometimes after the lapse of months. The answer to the third question depends upon the duration of the blindness. Yet it is never too late for a decompressive operation, as two successful cases prove. Finally the author recommends in addition to the palliative trephining, to use lumbar puncture, or a specific treatment, perhaps a second operation on the other side with or without incision of the dura, or it may be an extirpation of a tumor may follow.

KRASSNIG (298, **Rhinogenous retrobulbar neuritis**) reports six cases in which intranasal intervention, removal of the turbinates, or opening of the ethmoid and sphenoid cavities, immediately improved the vision of patients who had been blinded either wholly or partially in one or both eyes by a retrobulbar neuritis.

LAGRANGE (299, **Hereditary optic atrophy**) reports the following case. A boy 18 years old had suffered a marked impairment of his vision within a period of three or four months eighteen months before. The vision of the right eye was $\frac{1}{10}$, that of the left $\frac{1}{2}$. The ophthalmoscope showed a uniformly pale atrophic papilla with sharp margins, slaty reflexes, slight excavation, and very small vessels. The region about the papilla and the macula were unchanged. The field for white was normal, that for red contracted about ten degrees, there was total green blindness. Health was good and there were no psychical or intellectual defects. According to the family history the same symptoms had appeared in two brothers of his mother. Roentgenograms of the region of the hypophysis gave nothing positive, the mass of the skull was normal. Wassermann was negative. Examination of the blood showed a normal cell content with reduced coagulability. The condition of the papilla, the loss of function consequent upon alteration of the papillomacular bundle, the exclusion of infectious

causes, the absence of any intoxication, the hereditary character of the disease, and its onset during puberty seemed to make the diagnosis positive. In this patient the parallel running hæmophilia, and a considerable improvement of the vision of one eye following administration of thyroidin were noteworthy.

YOUNG and LOEVENHART (316, **The relation of the chemical constitution of certain organic arsenical compounds to their action on the optic tract**) found that compounds of organic arsenicals with an amino group or substituted amino group in the paraposition to the arsenic, produced optic tract lesions in the rabbit. There were no lesions produced with the amino group or substituted amino group in the ortho or meta position. The above held true for both trivalent and pentavalent compounds. They concluded that the valence of the arsenical compounds did not cause the optic lesions but that a presence of an amino group in the compounds in the paraposition to the arsenic was the important factor. They found, however, that the valence in certain instances modified the intensity of the action of a given organic arsenical compound on the optic tract. ALLING.

(To be continued.)

A MEMOIR OF DR. S. LEWIS ZIEGLER.

By Dr. PAUL J. SARTAIN, Philadelphia.

Dr. S. Lewis Ziegler, an ophthalmologist of international reputation, succumbed to an attack of pneumonia on January 4, 1926.

Doctor Ziegler was born in Lewisburg, Pa., February 5, 1861; received his preliminary schooling there and then entered Bucknell University, from which he was graduated with the degree of A.B. in 1880.

He came to Philadelphia in 1882 and matriculated in the Medical School of the University of Pennsylvania, and was graduated in 1885, then served as interne at the Germantown and Episcopal Hospitals and finally at the Wills Hospital, in which he later became Attending Surgeon and subsequently Executive Medical Officer.

In 1889 he organized the eye clinic at St. Joseph's Hospital, and remained a member of the staff up to the time of his death.

In recognition of his work, he subsequently received his M.A. from Bucknell and had the honorary degree of Sc.D. conferred on him by that University in 1900, and the degree of LL.D. awarded him by Lafayette College in 1915.

A close observer, of keen and analytical mind, he studied his cases with an untiring exactitude which generally brought him to conclusions logically correct and sometimes at variance with the usually accepted theories of etiology or pathology.

His treatment, always rational and often original for difficult and obscure cases, has, in many instances, become accepted as most efficacious.

His ingenuity in inventing and supervising the making of new instruments in ophthalmic practice was of absorbing interest and genuine pleasure to him and some of his special operations

have received well merited international recognition and adoption.

As an operator, skillful, decisive, quick, meeting the emergency as it arose, often anticipating a complication, his results averaged high, and in many cases referred to him after unsuccessful operations, his V-shaped iridotomy, which he so dextrously performed, gave brilliant results.

Among the many operations devised by him may be mentioned several for trachoma, galvanocautery puncture in ectropion and entropion, rapid dilation of the tear duct in the radical treatment of lacrimal disease, various forms of tenotomy, partial tenotomy and capsulomuscular advancement, trefoil or stellate keratectomy for anterior staphyloma, complete discission of the lens by the V-shaped method, subconjunctival excision of pterygium and multicolor tattooing of the cornea. Many monographs record the subjects which claimed his special attention and investigation, and he was one of the early advocates of the use of electricity in ocular therapeutics.

Doctor Ziegler took the keenest interest in the new developments in the general field of medicine, and his activities outside his own specialty were evidenced by his valuable work in the local chapter of the American Red Cross, and his successful administration as Director of the Bureau of Health and Charities of the City of Philadelphia.

For some years Doctor Ziegler had been writing and collecting material for a monumental work upon the surgery of the eye. He had spent much time in the great libraries of Europe consulting original authorities and having photographic copies made of the portraits of the most noted ophthalmic surgeons from the earliest times. These portraits together with reproductions of an admirable set of drawings of operations made under his direction, would have been the illustrations for the text, still unfinished, which it was the ambition of his life to complete.

His appreciation of art and love of the beautiful led him into the field of collecting during his visits to Europe, and made a pleasant diversion from his work;—relaxation he had never learned.

A Fellow of the College of Physicians of Philadelphia and

former President of its Ophthalmological Section, a member of the American Ophthalmological Society and of the American Academy of Ophthalmology and Oto-Larynology. Fellow of the American College of Surgeons and member of various European Societies, he was a regular attendant at the Ophthalmological Congresses where he presented many papers and made many friends. His genial personality, sterling honesty in his work and unswerving loyalty to his friends and colleagues remain with us as a cherished memory.

CORRESPONDENCE.

Mydriatics in Refraction.

Editor Archives of Ophthalmology.

Dear Sir:

I am just in receipt of my copy of the *Transactions of the Ophthalmological Society of the United Kingdom.* It contains also the Proceedings of the Convention of English-Speaking Ophthalmological Societies in London.

Among the very interesting papers read at the Convention was one by Mr. J. Burdon-Cooper on "The Behavior of the Crystalline Lens System in Artificial Cycloplegia and its Influence on the Refraction of the Eye." In this paper Mr. Burdon-Cooper claims that patients, and I think he means the majority of patients under fifty, will take a higher *plus* and a lower *minus* lens when the two eyes are examined together without atropine than when they are under the influence of atropine. "The phenomenon," he says, "does not occur with cocaine or homatropine."

Possibly my experience of thirty years may be sufficiently interesting to justify a few words in your valuable journal.

When I began Ophthalmological work I did as I had been told; for refractions, atropine in young children and squint cases, homatropine with cocaine in other people at less than "old age."

Within a few years I was using any cycloplegic much less frequently, as a routine not at all, because I had observed that binocular altered the uniocular examination, often gave as high a *plus* glass and as low a *minus* as did the cycloplegic. From the ordinary quarter or half diopter the increase of binocular over uniocular might rise much higher in young people.

As the years passed I began to notice that I had previously

frequently prescribed convex glasses that in later examinations of the same patients turned out to be considerably lower than were then required. I returned to the use of two percent homatropine and cocaine. Not only do I still use that solution, but I use it at a greater age than formerly because it has appeared to me that round the age of forty many patients, especially nervous women, have what is called a spasm of accommodation.

During the last ten or a dozen years, I have frequently remarked to my colleague that the highest *plus* glass obtained for each eye separately when the solution was used was less than that which could be taken at the subsequent examination without a cycloplegic the following day or two days later. I have records of such observations during many years. Probably Mr. Burdon-Cooper is right when he explains this phenomenon by a forward dislocation of the lens on account of the relaxed state of the ciliary apparatus.

In discussing Mr. Burdon-Cooper's paper several of the speakers stated that they seldom used a mydriatic in refraction cases. After trying both ways I have decided in favor, not of atropine which I seldom use, but of homatropine and cocaine, and that for two reasons; while in some cases a higher *plus* glass seems indicated when no mydriatic is used, even when each eye is examined separately, than when homatropine and cocaine are used six times in an hour, this is not generally true. A higher *plus* or a lower *minus* will often be taken with the mydriatic than binocularly without it. The point to remember is that the examination under the mydriatic may have to be essentially changed at a second examination. This should always be made. To prescribe glasses from the mydriatic examination is undoubtedly a vital mistake. Even when the cylinder changes I am inclined to give the lens and axis that seem proper at the second examination.

The other reason why I think it well to use a very temporary mydriatic is on account of the ophthalmoscopic examination. There may be excellent vision along with conditions behind a contracted pupil that even the most expert and careful examiners may miss to their subsequent regret.

ALEX. W. STIRLING,
Atlanta, Ga.

IV.—**Visual Field Studies.** By Dr. Ralph I. Lloyd, Brooklyn, Surgeon New York Ophthalmic Hospital. Cloth, 216 pages, with 124 illustrations. Published by E. C. Swezey, 50 Pine Street, New York. Price $6.00 net.

The author of this book is well known in connection with a popular stereocampimeter, and by numerous contributions to literature on the subject of field taking, yet a careful review of his book gives the impression of hasty preparation, and as a result much excellent subject matter is obscured by many outstanding imperfections. This is shown in the general make-up of the book, and arrangement of the subject matter, and by the fact that certain subjects do not seem to have received the consideration that their importance demands, while relatively unimportant subjects have been made unduly prominent. For example, no pages are given in the Table of Contents; the chapters are unequally divided, Chapter 4 containing 77 pages and Chapter 7 less than one page; the running titles at the top of each page do not follow any regular order, as in most books. A detailed description is given of many perimeters and other instruments long since discarded, while scant mention is made of Duane's screen and Elliot's scotometer, and these are not even illustrated. Considerable space is devoted to a description of field defects due to retinal and choroidal lesions. Since the causes of these defects can usually be seen with the ophthalmoscope, they are seldom of sufficient importance to be mapped out. More space is devoted to the consideration of squint than to glaucoma.

It would seem that the most important procedure in visual field studies should be the accurate mapping out of defects

in the central area according to the methods suggested by Bjerrum and Seidel, and the detection of very small central scotomata after the method suggested by Haitz, together with the best interpretation of these findings possible in the light of our present knowledge. These methods should be so thoroughly gone into and illustrated by numerous typical fields that the beginner in scotometry will have no difficulty in becoming proficient in this most important line of work, but Dr. Lloyd's treatment of this phase of the work is entirely superficial and inadequate.

It might be stated also that had the book been handled by one of the larger and better known publishing concerns they would undoubtedly have given valuable advice as to its general makeup. The price, $6.00, is excessive.

A. H. THOMASSON.

V.—**Ophthalmic Neuro-Myology.** By DR. G. C. SAVAGE. Second Edition, cloth, 215 pages, 10 pages of index, 39 plates and 12 illustrations. Published by the author, Nashville, Tennessee, and printed by McGuiddy Publishing Co., Nashville, Tenn. Price, $3.00.

The book treats of the subject of "ocular muscles from the brain side of the question," as expressed by the author. He has made no change in the chapters treating on the detection and treatment of heterophoric conditions, these remain practically the same as in the first edition of 1905. Pages 6 to 12 have been rewritten. The author's belief now is that the eye has but two axes of rotation, the vertical and the transverse. Around but one of these is effected any cardinal rotation, the oblique rotations being about both axes simultaneously. The tables given in this chapter give the author's conception of the synergistic and antagonistic action of the muscles. The hypothesis on which ophthalmic neuro-myology is founded is that there are eight conjugate brain centers in the cortex which control version and one center controlling convergence. These he states are each connected with the muscles. The twelve basal centers being each connected with the test are diagrammatic representations of the action of these centers.

Many of the statements made seem theoretical rather

than facts resulting from a mass of clinical evidence. This is so more especially in the action ascribed to the elevators and depressors.

The author uses the monocular phorometer, an instrument designed by him and de Zeng. This instrument is described fully, in pages 211 to 215.

The writer believes that the findings obtained by any such instrument are often faulty and misleading. They give a false sense of security in the diagnosis of muscle anomalies and lead to misdirected treatment. More accurate and practical findings may be obtained by the excursion test combined with the cover test.

Ophthalmologists are grateful to Dr. Savage for this addition to his previous publication.

J. W. WHITE.